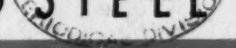
GAS

ENGINEERING • UTILIZATION • LOAD-BUILDING • MANAGEMENT

Industry's FUEL BIN

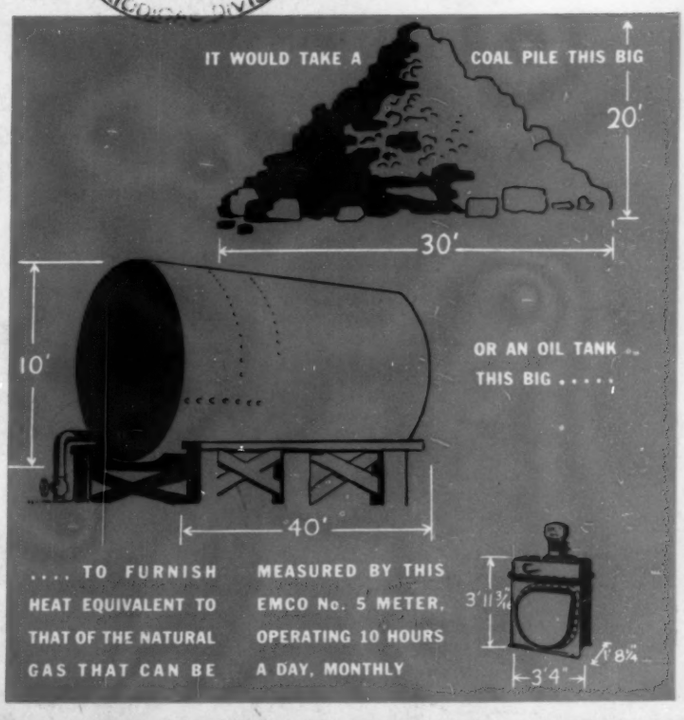
THE EMCO PRESSED STEEL METER



Of industry's three most widely used types of fuel, gas, coal and oil, gas alone offers unique savings in addition to its inherent operating advantages and efficiencies. In the case of storage, no valuable space is occupied, there are no annoying fire hazard requirements and no increased insurance premiums. In handling, gas is available at the turn of a valve. No expensive stoking or firing equipment, heating equipment or mixing valves are required. Also, the investment in stored fuel is eliminated, working capital is not tied up and payments are made after use, based on definite accounting periods.

This simple easy system of fuel supply is dependent upon metering equipment developed for this service itself. EMCO Meters, developed specifically for industrial services, provide the necessary accuracy, ruggedness and simplicity. They have progressed hand in hand with the growth of industrial gas consumption.

Reprints of this advertisement available to Industrial Sales Departments of Gas Companies upon request.


IT WOULD TAKE A
COAL PILE THIS BIG
20'
30'
10'
OR AN OIL TANK ..
THIS BIG .....
40'
.... TO FURNISH HEAT EQUIVALENT TO THAT OF THE NATURAL GAS THAT CAN BE MEASURED BY THIS EMCO No. 5 METER, OPERATING 10 HOURS A DAY, MONTHLY
3'11¾"
3'4"
1'8¾"

PITTSBURGH EQUITABLE METER CO.

MERCO NORDSTROM VALVE CO.

MAIN OFFICES PITTSBURGH, PA.

NEW YORK	LOS ANGELES	TULSA	HOUSTON	MEMPHIS	BUFFALO
COLUMBIA	KANSAS CITY	CHICAGO	PHILADELPHIA	ATLANTA	OAKLAND

AUGUST 1937 • • 25 CENTS

FOUR HUNDRED & ONE

Pigeon-holed Plans

Fluor Aerator Type Towers are durable. California Redwood, the structural material, is selected because of its characteristic strength, stability and long life. The Fluor patented Aerator design is such that no straight line passage of air or water through the tower is possible. Cooling decks, of a design exclusive to Fluor, assure perfect water filming with fastest dissipation of heat. Obvious results: water distribution is undisturbed, spray is not carried through the tower and cooling performance is uniform.

In any line of technical progress, the start is usually made on the level, followed by a slowly rising curve, and in due time, by a rapid acceleration that results from the fund of patiently acquired data.

Years went by during which cooling towers were built in line with old-fashioned habits—as free from patentable improvements as an earthenware jug. Fluor engineers were faced with cooling tower problems in the regular course of their work, and, as engineers, they dug down to first principles. Certain improvements were obviously possible and plans were made for their realization. One step led to another—more plans—tests of results—correction of errors—and still more plans.

So Fluor Aerator Type Cooling Towers came into existence as the result of four hundred and one pigeon-holed plans, each forwarding the progress in the approach to perfection. Outstanding improvements are covered by ten patents issued, with others pending. And Fluor goes on, with the recognition of its progress in every industrial country on earth. Write for Bulletin T236.

FLUOR BE SURE WITH FLUOR **AERATOR TYPE COOLING TOWERS**

THE FLUOR CORPORATION, LTD. Main Office and Plant: 909 East 59th Street, Los Angeles, Calif.
909 McCormick Building, Chicago, Illinois • 703 Fairfax Building, Kansas City, Missouri • 934 M & M Building, Houston, Texas • 710 Canadian Pacific Building, New York City, N.Y. • 719 McBirney Building, Tulsa, Oklahoma

Note to Reader

This is the sixth in a series of advertisements dramatizing one engineer's experience with his first Dresser-coupled line. For the complete story, write for Bulletin No. 351.

"TALK ABOUT 'LONG LIFE'! -THIS DRESSER JOINT IS CERTAINLY A GOOD EXAMPLE"

The first and most essential requirement of a satisfactory pipe joint is tightness—not just when installed, but for the life of the line. Thus, service records are the only certain proof of long-time dependability.

The coupling in the photograph typifies the performance that Dresser Couplings are giving on 150,000 miles of pipe line. It is still serving continuously, in its 34th year, with never a cent for maintenance! This is nothing unusual for Dresser flexible joints.

S. R. DRESSER MFG. COMPANY, BRADFORD, PA.

In Canada: Dresser Mfg. Company, Ltd., 60 Front Street, West, Toronto, Ontario

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MEMBER AUDIT BUREAU OF CIRCULATIONS

GAS

Reg. U. S. Pat. Off.

Formerly Western Gas

LOS ANGELES	CHICAGO	HOUSTON
810 South Spring Street	1064 Peoples Gas Building	306 Shell Building
Phone MIchigan 1481	Phone HARrison 8536	Phone Capitol 2093

JAY JENKINS, Publisher
ARTHUR ROHMAN, Managing Editor
W G. RUSSELL, Field Representative

CRAIG ESPY, Assistant Publisher
ANATOL FOMILYANT, Southwest Editor
E. M. ALLEN, News Editor

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August, 1937. Volume XIII, Number 8. G A S is published monthly by Western Business Papers, Inc., at 810 South Spring Street, Los Angeles, California. Jay E. Jenkins, President; Craig Espy, Vice-president; George H. Finley, Vice-president; James E. Jenkins, Secretary-Treasurer. Subscription price (in advance) 25 cents the copy. $1.00 per year; other than U. S., $2.00 per year. Entered as second class matter August 20, 1936, at the post office at Los Angeles, Calif., under the Act of March 3, 1879. Copyright, 1937.

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Publishers: OIL & GAS *Equipment Review;* HANDBOOK OF BUTANE-PROPANE GASES (Two Editions).

Another new STATION *— another call for* COOPER — BESSEMERS!

"NORTHERN NATURAL"

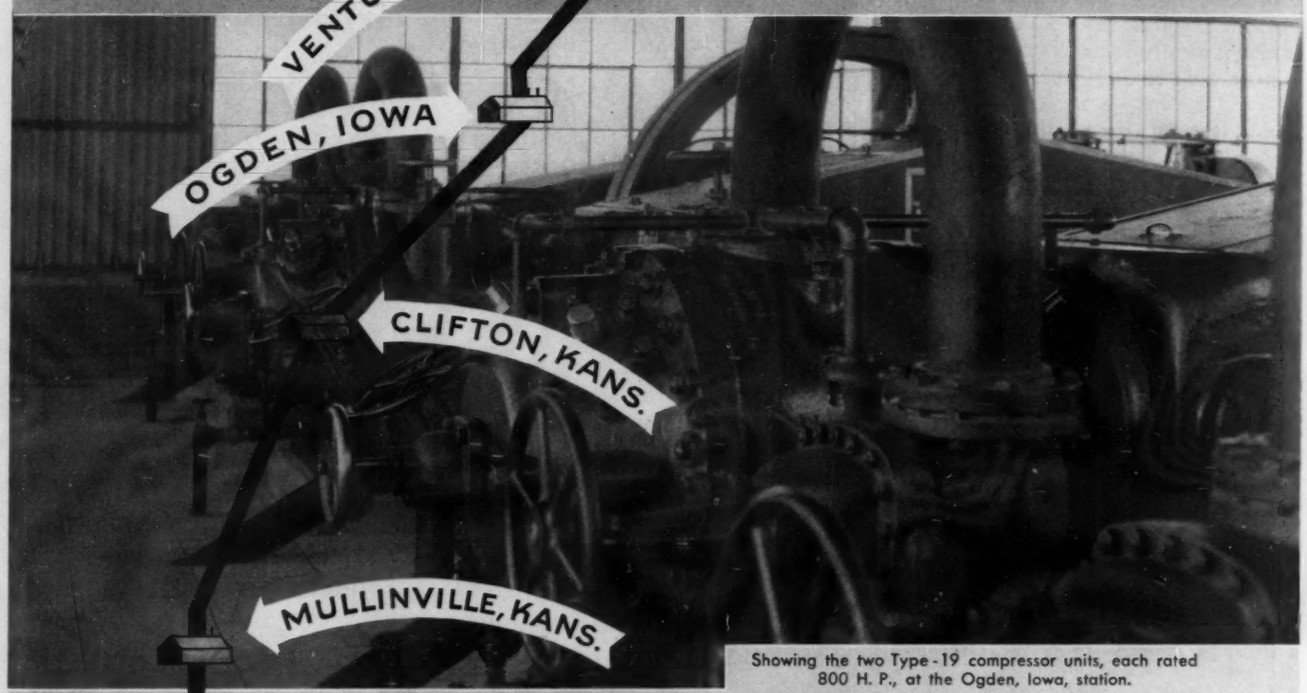
VENTURA, IOWA

OGDEN, IOWA

CLIFTON, KANS.

MULLINVILLE, KANS.

SKELLYTOWN, TEXAS



Showing the two Type-19 compressor units, each rated 800 H. P., at the Ogden, Iowa, station.

To meet the increasing demand for natural gas in Minneapolis and St. Paul, the Northern Natural Gas Company once again has said, *"Give us more Cooper-Bessemers!"*

The newest main-line compressor station is located at Ventura, about 12 miles west of Mason City, Iowa. Three Type-19 twins (each rated 800 H. P.) will insure the same uninterrupted service that has made Cooper-Bessemers so satisfactory in the four other stations, shown.

THE COOPER-BESSEMER CORPORATION

640 EAST 61st STREET . . . LOS ANGELES, CALIFORNIA

25 West 43rd St., New York City Mills Bldg., Washington, D. C. 631 Spring St., Shreveport, La. 201 East 1st St., Tulsa, Oklahoma Magnolia Bldg., Dallas, Texas Esperson Bldg., Houston, Texas

Mount Vernon, Ohio — PLANTS — Grove City, Pennsylvania

Goodbye to Scale trouble!

. . . *install* NATIONAL SCALE FREE PIPE

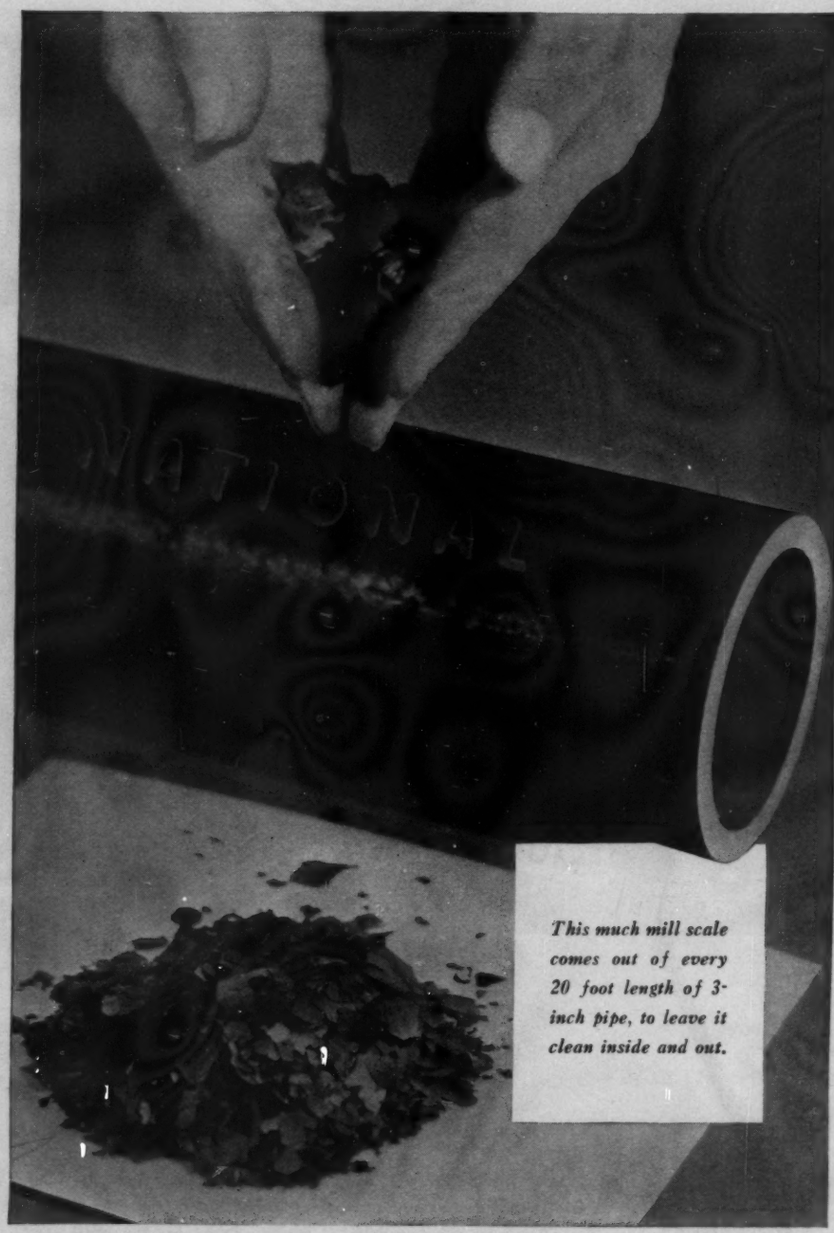
USE NATIONAL Scale Free Pipe and get rid of costly trouble caused by mill scale. Its smooth, clean interior makes it highly desirable for gas service lines because it has nothing which might clog small orifices, injure meters, or otherwise harm service. Mill scale is removed mechanically from NATIONAL Pipe—butt-weld sizes ½ to 3 inches.

IT IS SPELLERIZED
— to resist corrosion

This removal of mill scale, plus the special Spellerizing Process applied to butt-weld sizes 4-inch and under, gives NATIONAL Scale Free Pipe extra resistance to corrosion. Avoid costly repairs or replacements by specifying or ordering NATIONAL, the original Scale Free Pipe.

ADVANTAGES

1. Minimized corrosion—particularly pitting.
2. Better base for galvanizing or other protective coatings.
3. No damage to valve seats; no clogging of small orifices.
4. Greater strength at the weld—due to the extra rolling in the process.



This much mill scale comes out of every 20 foot length of 3-inch pipe, to leave it clean inside and out.

NATIONAL
Scale Free
PIPE

NATIONAL TUBE COMPANY

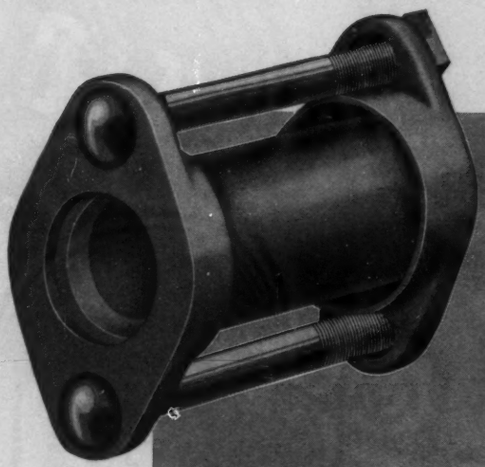
PITTSBURGH, PA.

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

DAYTON

Number One

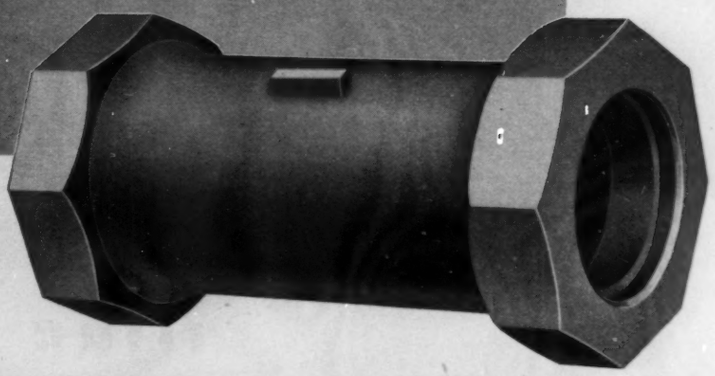


Dayton Number One Couplings furnished regularly, in service sizes, with Malleable Flanges and Seamless Steel Centers provide an ideal connection for service lines.

Dayton Boltless Couplings furnished in full range of sizes from ½" to 2" inclusive are available with centers 3", 5" or 10" long. Constructed entirely of Malleable iron they are an excellent coupling where corrosive soil is encountered.

The same gaskets are used in either type of coupling permitting the use of either plain, lead tipped, or duck tipped gaskets in either coupling.

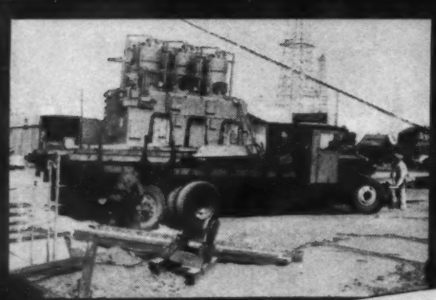
Boltless



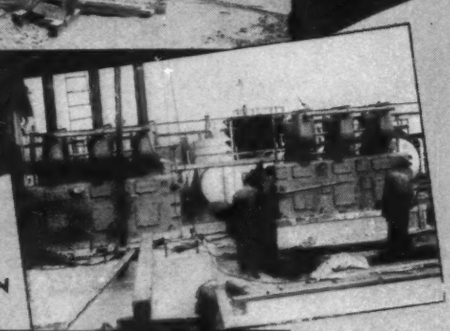
THE NATIONAL SUPPLY CO. OF DELAWARE
DAYTON COUPLING DIVISION · · TOLEDO · OHIO

Modernize Your

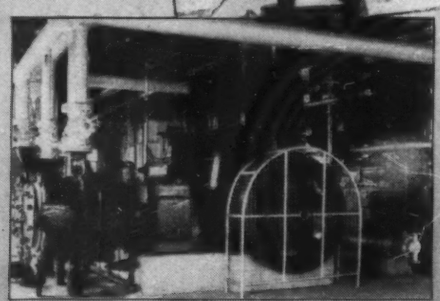
Old SLOW MOTION Gives way to MODERN



LOW TRANSPORTATION COST



SMALL FOUNDATION



LOW ERECTION COST — ENGINES ARE ASSEMBLED AT FACTORY

The new CLARK Super-2-Angle Compressor is introducing entirely new standards of EFFICIENCY and LOW COSTS in the installation and operation of Gas Booster Stations. This unit equals or exceeds any other type of compressor in power and efficiency, yet effects substantial savings in 5 important ways—as follows:

1. CUTS TRANSPORTATION AND ERECTION COSTS because shipped practically assembled.
2. SMALLER FOUNDATION due to right-angle design.
3. LESS FLOOR SPACE, SMALLER BUILDING.
4. SAVES FUEL, due to CLARK Super-2-Cycle Fuel Injection.
5. LOWER MAINTENANCE due to extreme simplicity of design and few parts.

Engineers throughout the industry are investigating, and important installations are already in operation, from coast to coast. Write for literature.

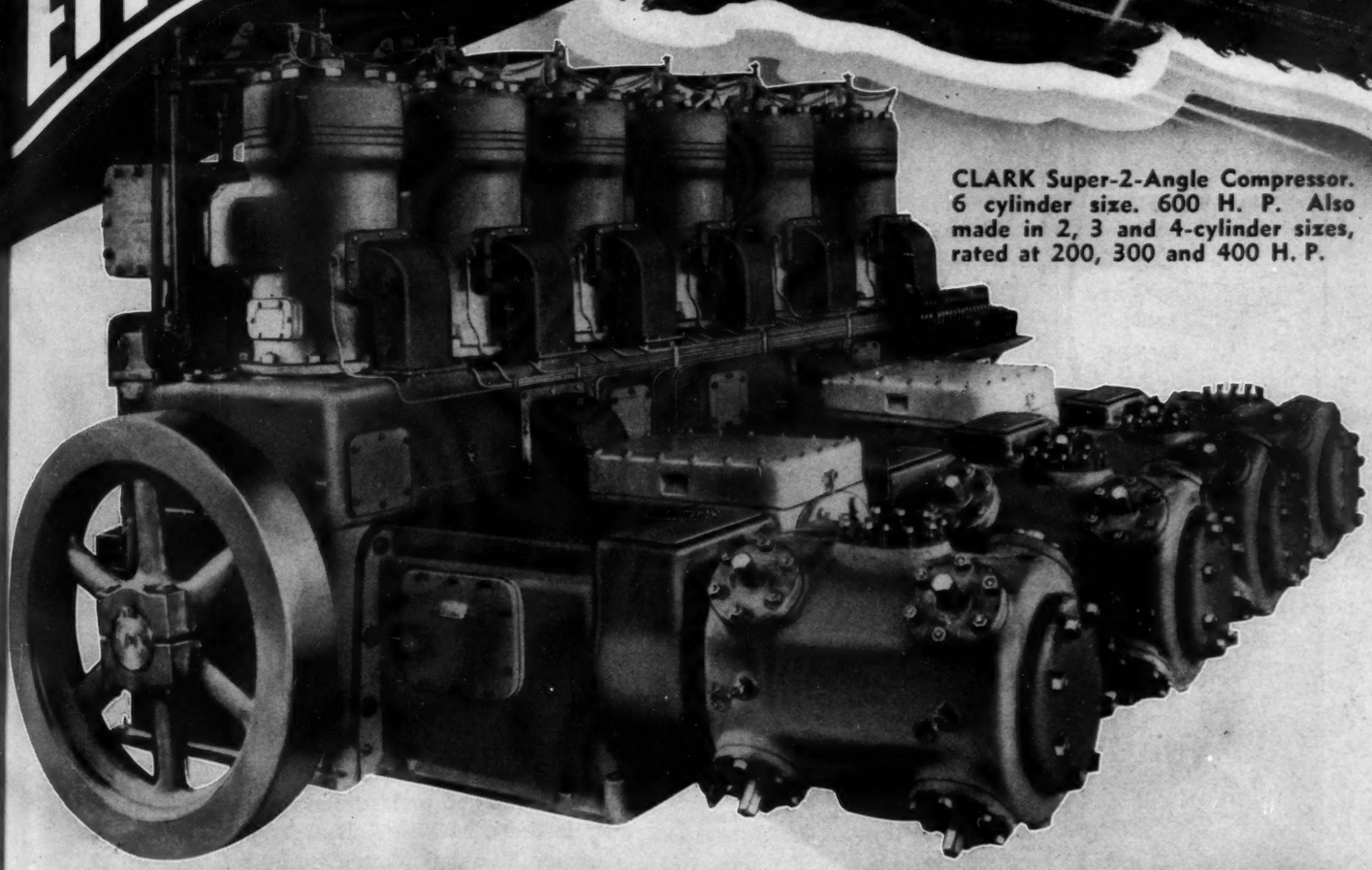
CLARK BROS. COMPANY - Olean, New York, U. S. A.

Export Office: 30 Rockefeller Plaza, New York. Midcontinent Sales Offices and Warehouses: Tulsa, Okla. and Houston, Texas. West Coast Office: Smith-Booth-Usher, 2001 Santa Fe Av., Los Angeles, Cal. Foreign Offices: 72 Turnmill St., E. C. 1, London, England; 4 Str. General Poetas, Bucharest, Roumania.

r Gas Booster Station!

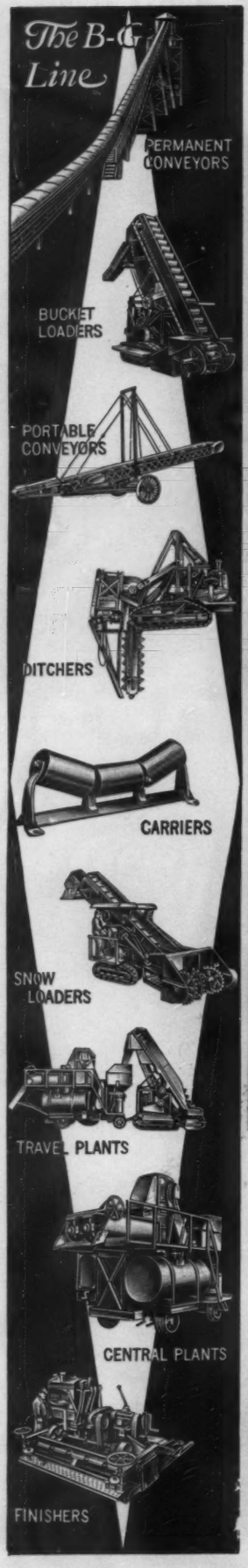
SUPER 2 ANGLE

RN EFFICIENCY

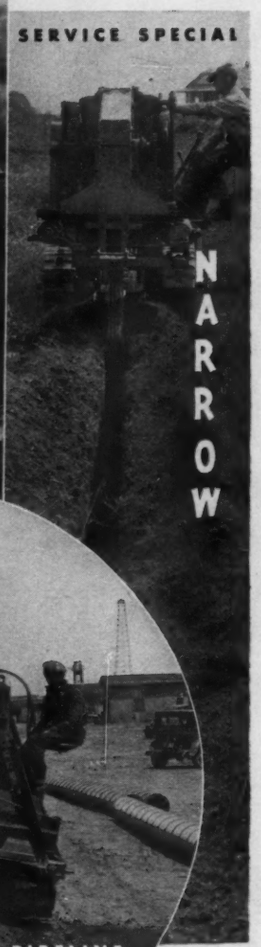


CLARK Super-2-Angle Compressor. 6 cylinder size. 600 H. P. Also made in 2, 3 and 4-cylinder sizes, rated at 200, 300 and 400 H. P.

CLARK



4 Barber-Greenes



The same exclusive basic design applies to all B-G Ditchers. They have demonstrated their milling ability through Florida's coral rock. The self-cleaning buckets have proven themselves in the stickiest gumbo, and the records set by B-G's in the oil fields show dependability and speed that insures profitable ditching.

Standardized Material Handling Machines

BARBER GREENE

715 West Park Avenue
Aurora, Illinois

All four Barber-Greene Ditchers have the Patented Vertical Boom that digs straight down, the Automatic Overload Release that protects the machine and underground pipe, Self-Cleaning Buckets, Milling Action Digging, and full Crawler Mounted Maneuverability.

The Standard 44-C digs down to 8'3" deep. The Pipe Line Special has the extra speed that pays real dividends in mile after mile of ditching. The Utility Special has the B-G Off-Set boom that digs up close to obstructions on either side. And the Service Special is so narrow and compact it pays for itself on jobs as small as service connections. Write for literature today, there is no obligation.

7-37

300 Times an Hour

OPEN, shut—open, shut. Ceaselessly, valves are opened and shut in a special "torture machine" at the Crane laboratories. Five times a minute . . . 300 times an hour . . . 2,400 times every eight-hour shift, until the stem gives up its life and the "post-mortem" adds to the vast body of Crane knowledge of valves.

Engineers tabulate the results and study the thread profiles and thread clearances of the valves when finally they are worn out. From this comes definite information showing how to make good valves better . . . and better valves the best for their type of service.

Crane has tested to destruction thousands of valves, seeking information with which to build still better valves. Crane meets the challenge of "new" valve problems with solutions based on 82 years of valve and piping experience. Look in your No. 52 and other Crane catalogs for the details regarding over 38,000 items, tested in the laboratory and proved on the job. Use them whenever you need valves, fittings, pipe or accessories. CranEquip for satisfaction.

CRANE

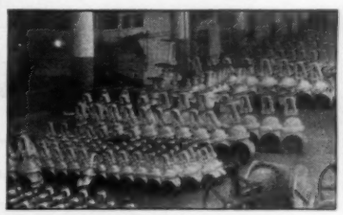
CRANE CO., GENERAL OFFICES: 836 S. MICHIGAN AVENUE, CHICAGO, ILL.
Branches and Sales Offices in One Hundred and Sixty Cities

VALVES FITTINGS FABRICATED PIPE PUMPS PLUMBING AND HEATING MATERIAL

---

plied in the next few days.

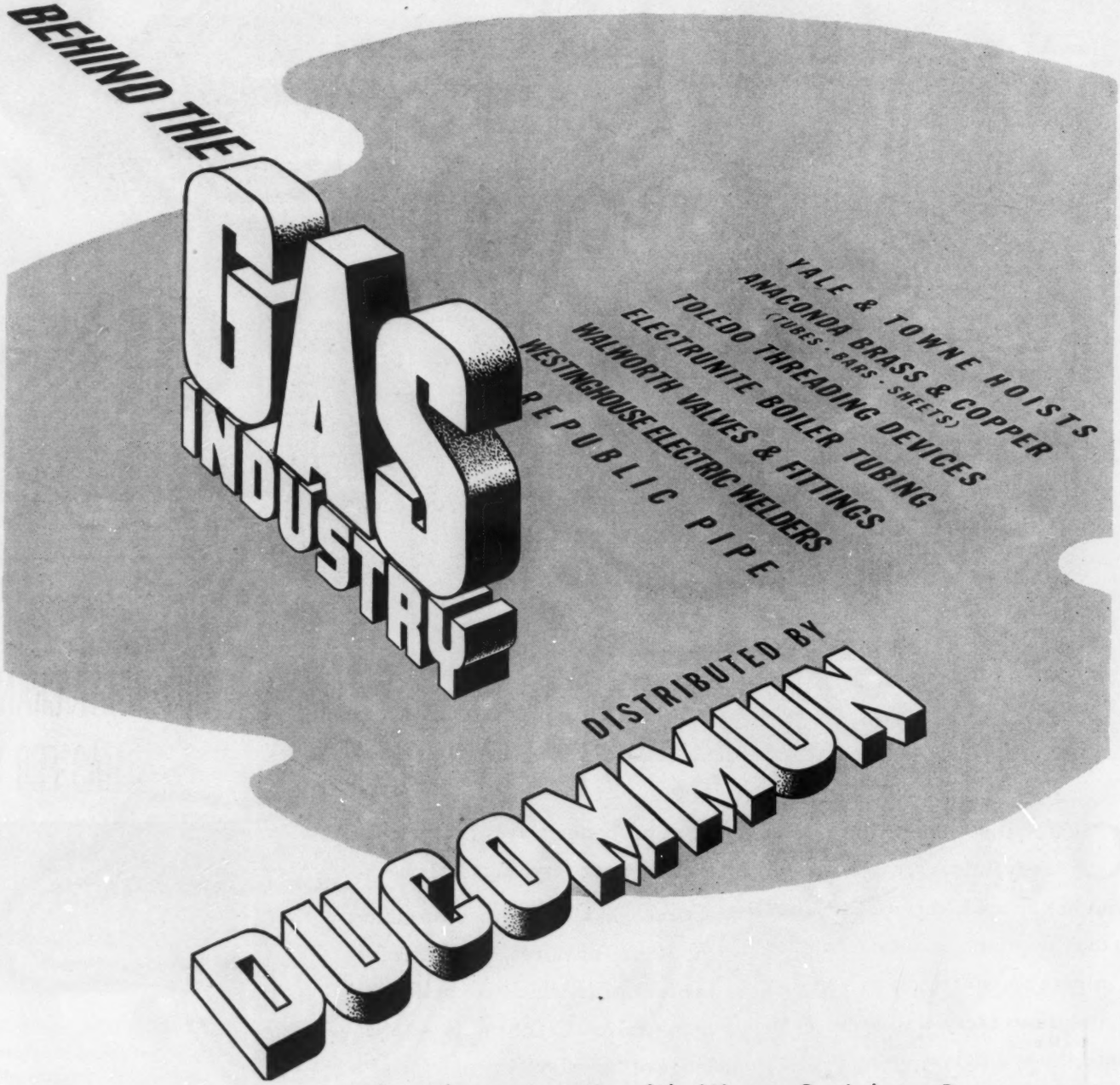
IT PAYS TO FIND OUT WHAT CRANE HAS FOR YOU



CHICAGO, ILL., July 20—No industry should be more interested in the tests which Crane constantly runs to improve its high quality valves than the gas industry.

That is because Crane makes valves for every phase of gas control from casing head or coke oven to the kitchen burner. Thus wherever and whenever a valve must give you unfailing service, either in frequently recurrent operation or standing by for infrequent shut-downs, you can have Crane quality.

Just turn to your Crane No. 52 Catalog. See the index for the type of valves, fittings, or piping accessories which you need and turn to the pages which give you dimensions and details. In the Crane No. 52 Catalog is information about 38,000 items, tested in the laboratory and proved in service. Use it to CranEquip for satisfactory operation.



Since the very inception of the Western Gas Industry, Ducommun has consistently supplied it with the finest products available.

Ducommun Service, developed through these years of "growing-up" with the industry, is outstanding in its own right. Backed by the engineering genius and vast experience of the companies it represents, it is unbeatable!

DUCOMMUN METALS AND SUPPLY COMPANY

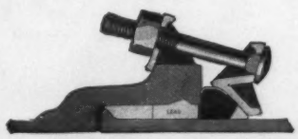
LOS ANGELES • SAN FRANCISCO

STOP
BELL AND SPIGOT
JOINT LEAKS

SKINNER-SEAL

MEANS INNER SEAL FOR LASTING REPAIR

● Coss-section shows exclusive Skinner method of SEALING rubber gasket under pressure. Direct! Positive! Lasting!



● Direct in action, SKINNER BELL JOINT CLAMPS make an instant, effective, lasting repair. Three unique features . . . gasket SEALED by Monel metal sheath band . . . self-adjusting to variations in pipe thickness . . . ¾″ cadmium plated bolts. Sizes 3″ to 48.″ WRITE TODAY FOR CATALOG.

M. B. SKINNER CO. *Est. 1898* **SOUTH BEND, IND.**

The Gas Service is only as Modern as the Gas Range

Universal Simmer-Save Burner GIVES PERFECT CONTROLLABILITY FOR ALL METHODS OF TOP BURNER COOKERY

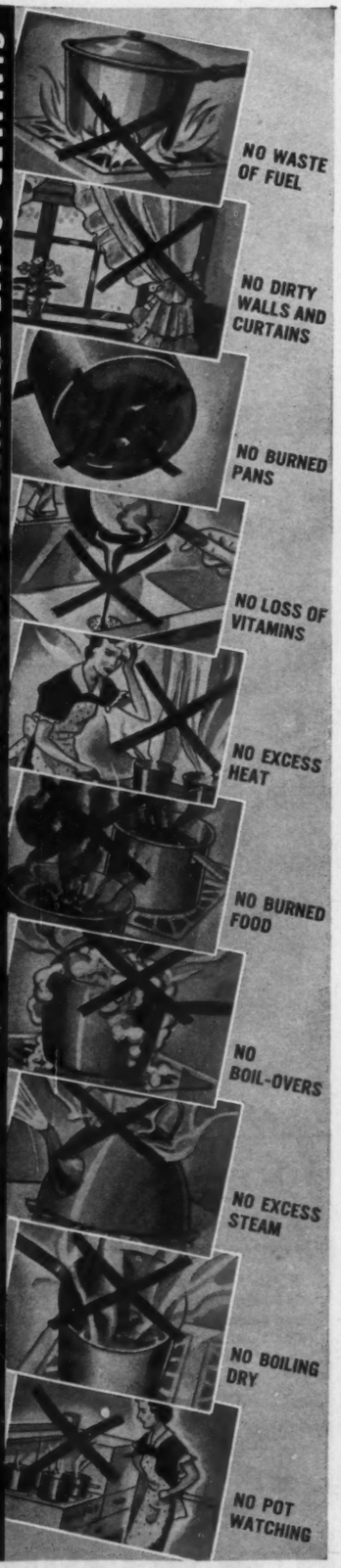
● The Universal Gas Range makes possible an entirely new standard of top burner cooking service from five distinct standpoints, (1) controllability, (2) convenience, (3) economy, (4) saving of labor and time, (5) comfort and health.

The operating and service advantages Universal presents to the gas consumer are not advertising fantasies, but definite proven facts that interpreted in terms of the Homemaker's interest mean elimination of the objectionable features associated with cooking on an obsolete or ordinary range.

The Universal Gas Range not only presents new possibilities in so far as advertising and sales promotion are concerned, but in addition creates a new appreciation on the part of the consumer that gas when utilized through a truly modern range is the ideal cooking fuel.

Universal Simmer-Save Burner is actually two burners in one, containing: (1) Two burner throats. (2) Two separate valves. It gives an automatically controlled boiling heat.

SIMMER-SAVE BURNER ELIMINATES OBJECTIONABLE COOKING CHORES



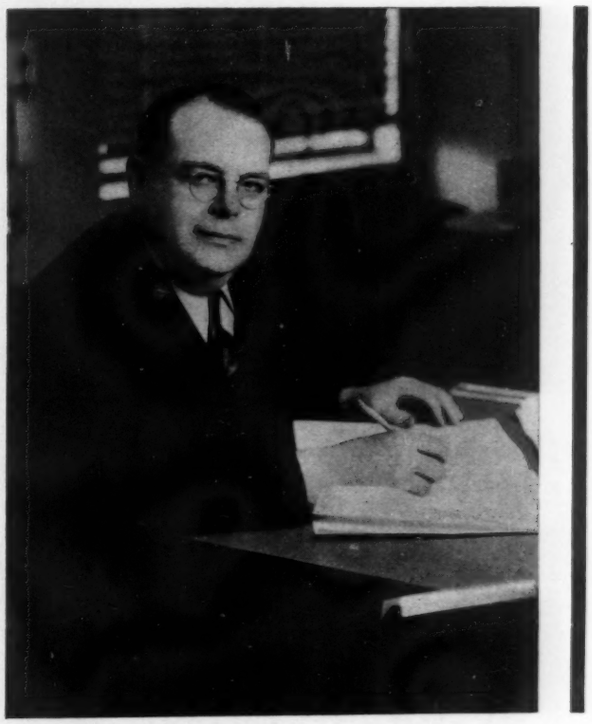
THE STANDARD OF COOKING PERFORMANCE DEPENDS ENTIRELY ON THE DEVICES CONTAINED IN THE RANGE

UNIVERSAL GAS RANGES

MANUFACTURED BY CRIBBEN & SEXTON COMPANY, 700 NORTH SACRAMENTO BOULEVARD, CHICAGO, ILLINOIS

GAS
August, 1937

Guest Editorial



SHOULDER TO SHOULDER!

By JAMES F. POLLARD

President, Pacific Coast Gas Association
President, Seattle Gas Company

"SHOULDER to Shoulder" will be the theme song of the Pacific Coast Gas Association's forty-fourth annual convention in Seattle this year. It is the natural sequel to last year's motif, "Forward March, Gas!" It suggests the utmost in cooperation between every branch of the industry which is the only defense against the fierce competition with which gas men are faced today.

Capital and labor marching shoulder to shoulder in mutual confidence and understanding by each, of the other's problems, aims and objectives, will win for gas its rightful place in the sun.

Gas appliance and equipment manufacturers must march shoulder to shoulder with the gas utilities and the American Gas Association to lay the basic foundation of national public acceptance for "Gas is your quick, clean, economical servant," the new slogan of the national advertising campaign. What does it profit to make gas service rates more attractive than any other competitive fuel costs? Or what advantage is there to be gained by manufacturers building ever more convenience, efficiency, speed, and beauty into domestic gas appliances and producing a super "Certified Performance Range" if Mrs. John Q. Public doesn't know about it and doesn't take the trouble to find out about it because her mind has been so thoroughly filled through advertising with the belief that some other type of service is more modern, cleaner and safer?

What is the answer to the fact that in a recent survey of a thousand women in one of the major cities of our country it was found that only two-tenths of one per cent of them had ever cooked with an electric range and yet twenty per cent said the next range they bought would be an electric range? The answer is advertising!

Shoulder to Shoulder, Manufacturers, Dealers, Utilities must widen, intensify and amplify the national gas advertising campaign with more money, more space and above all more local tie-in. Gas is clean, gas is economical, gas is convenient, gas is safe. No other service combines all of its advantages. Our job as gas men is to make the American Public conscious of these facts.

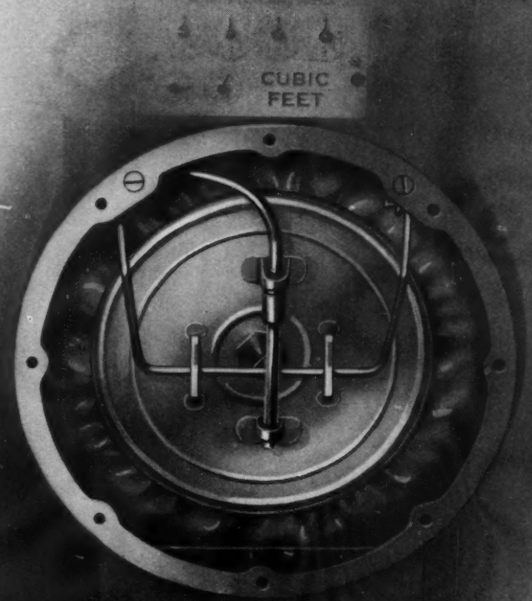
Yes...and diaphragms!

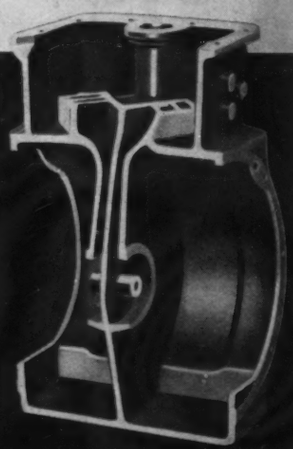
IN METRIC IRONCASE METERS, sustained accuracy of gas measurement begins right at the diaphragm. This follows the approved full bellows principle of design. It is sealed in a leak-proof body casting of one-piece gray iron — formed deep enough to avoid leather contact with corrosion-resistant case.

The back disc is anchored rigidly to the middle partition. Flag rods are so shaped and supported as to produce no unequal motion of fundamental measuring wall.

Ironcase leathers are the product of continuous research to develop the best leather and oils for specific gas conditions. Raw materials, uniformity of grade and thickness, special processing . . . all conform to strict laboratory standards.

Add these and other diaphragm qualities to the many distinctive Ironcase features. You have a proved total of meter accuracy and trouble-free service years. A full range of capacities; high or low pressures.





One-Piece Body Casting
Eliminates Internal Leaks

Volume and Pressure Gage
Charts Hourly Rate of Flow
and Pressure

ESTABLISHED 1836

AMERICAN METER COMPANY
INCORPORATED

PACIFIC METER WORKS • LOS ANGELES • SAN FRANCISCO

These and Other Important Features Fully Described in Catalog EG-40

August, 1937

GAS

Vol. XIII, No. 8

THIRTEENTH YEAR OF PUBLICATION

LOS ANGELES
810 South Spring Street

CHICAGO
1064 Peoples Gas Bldg.

HOUSTON
306 Shell Bldg.

GAS AIR CONDITIONING

Industry Opportunity Now Lies in Promoting this New Off-Peak Load

By JARED A. HILL

Pacific Gas and Electric Company*

FOR several years we gas men have been talking about air conditioning and the opportunities which it offers to us for load-building purposes. I am inclined to think that we have not thoroughly understood the term air conditioning and that our conversation has been largely concerned with summer cooling rather than with the larger field of complete air conditioning.

J. A. HILL

There are three distinct phases of air conditioning: winter air conditioning which consists of heating, circulation, air cleaning, and the control of humidity and temperature within the comfort zone; summer air conditioning which consists of cooling, circulation, air cleaning, and the control of humidity and temperature within the comfort zone; and year-round air conditioning which is a combination of the two. In this latter type of installation, the atmospheric conditions within a given space are completely controlled in both summer and winter with respect to proper temperature and air circulation, air cleaning, and humidity control.

From this definition it is readily seen that the gas industry is already well immersed in air-conditioning promotion, but so far its activities have been largely devoted to the winter phase. We are now getting a large proportion of the winter air-conditioning load through the sale and installation of forced-air, gas-fired furnaces which are equipped with filters for air cleaning, humidifiers, and humidity control. These installations use a fan to circulate and distribute evenly the air throughout the heated space. This is probably the most attractive kind of heating load which the utilities have promoted because it has a better load factor than the older types of heating and produces a somewhat lower gas consumption per installation than the gravity-type furnaces have ever done. Opinion differs among various members of the industry regarding the increased efficiency and resultant economy of this type of equipment as compared with the gravity installations. I think it is reasonable to say that these installations operate with a 15 to 25 per cent less gas consumption than the gravity jobs. This results in a higher average rate for the gas which is used and permits the utilities to build a higher saturation in gas heating without overloading the distribution systems, or aggravating the winter peak-load condition, than has been possible before with the usual gravity furnace installation. Needless to say, this type of equipment is almost entirely satisfactory to all persons concerned and probably is less vulnerable to competition than any type of gas-heating equipment which has been sold in the Pacific Coast market. This is a very satisfying condition.

I believe it is now axiomatic that the promotion of winter air conditioning, particularly for domestic installations, should precede the promotion of summer air conditioning for this class of customer because the customer's experience with winter air conditioning in a large measure lays the ground work for his acceptance of summer air conditioning at a later date. It also makes the installation of complete air conditioning much easier on the customer's pocketbook as he has already bought and paid for the fan, duct work, filtering equipment, etc. When this duct work is designed and installed, it should be of such a size that it will readily handle the larger volumes of cool air which are necessary for summer cool-

* To be presented before the Sales and Advertising Section of the Pacific Coast Gas Association at the annual convention, August 17-19, 1937, at Seattle, Wash.

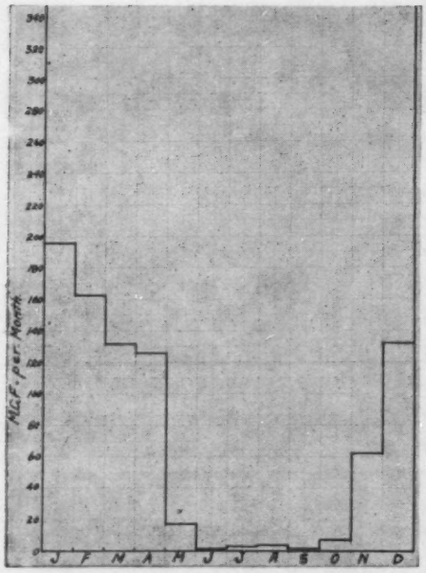


FIG. 1. Gas Consumption for winter heating in a typical metropolitan office building.

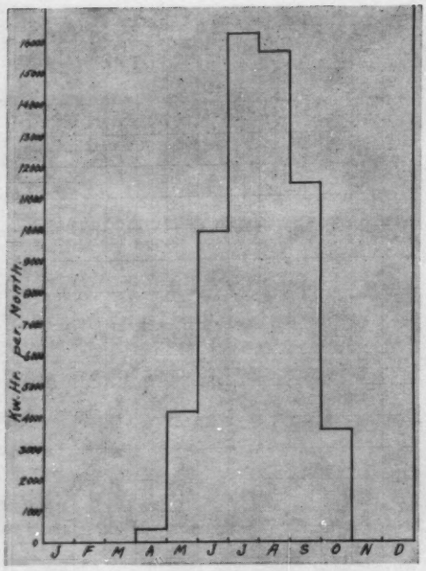


FIG. 2. Kilowatt hour consumption for summer air conditioning in a typical office building.

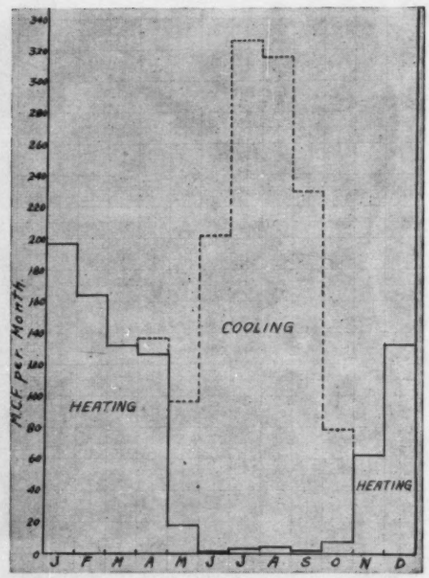


FIG. 3. Combined gas consumption for heating and air conditioning in a typical office building.

ing. Then it remains simply to install the cooling equipment in the same air stream which is used for winter heating to complete the installation of year-round air conditioning.

A similar condition prevails in the commercial market. Most commercial buildings of any size are already equipped with adequate steam-heating systems. At least 50 per cent of these installations are now served with natural gas and these owners already have a gas boiler installed together with services and meter, for serving their winter-heating load. These customers are in a receptive mood to install summer-cooling installation which will use steam from these boilers to produce the refrigeration effect necessary. In addition to this, most of the gas-rate structures are such that these same commercial customers can purchase their gas for summer operation at an attractive rate, or, putting it another way, the summer consumption will reduce their average gas rate throughout the year.

I believe a good deal of the past reticence on the part of the gas men in promoting summer cooling has been due to the fact that we have been looking for a direct gas-fired gadget of some kind which will produce "cold." If we hold to this attitude we are doomed to disappointment. We are overlooking the fact that we have a "natural" for the promotion and installation of summer cooling for both residential and commercial purposes.

Let us look at a typical send-out curve, Fig. 1, for a winter-heating plant in a commercial building: This curve is one for a building which uses approximately 1,000,000 cu. ft. of gas per season for heating purposes. No water heating is included in this consumption. It is very evident from a glance at this curve that there is room for a summer load on our distribution systems and the summer load which will fill up this valley is air conditioning. To prove this point further, let us look at a typical curve of the kilowatt-hour send-out for a compression refrigeration air-conditioning installation for the same building (Fig. 2). You will notice that this load is distinctly a peak load, occurring over a period of four short months during the summer time. This installation causes high maximum demands and requires a high investment cost in overhead or underground electric services to serve it. Because of the character of this load, it is not susceptible to promotional rates or will not encourage electric-rate reductions to popularize further this type of summer cooling. Fig. 3 shows the gas consumption when the building is equipped for both winter heating and summer cooling.

Load Balance

In order to serve a large amount of summer air-conditioning load, there must be some balancing winter load. Unless electric utilities already have such a winter load or are able to promote such a load to balance this summer conditioning, electric air conditioning will not continue to be attractive and popular with electric utility men. Conversely, the gas utilities definitely need this summer load to balance their already heavy winter-heating load. It may come as a surprise to some of you when I state that summer air-conditioning equipment with which we can build this summer load is already available and adequately represented in all of the large trading centers on the Pacific Coast.

There are four major types of systems with which we can work: (1) steam jet vacuum cooling, (2) absorption refrigeration, (3) Silica Gel adsorption, (4) ice engines. A brief description of each of these four systems, their advantages and disadvantages, is pertinent at this time.

The steam jet vacuum cooling system uses water as a refrigerant. The unique feature of refrigeration by water vapor is the "lift-yourself-by-your-boot-strap" factor, water being employed as a refrigerant for cooling itself for use in the cooling and dehumidifying of air in air-conditioning work. Air conditioning gave the vacuum vapor cycle its golden opportunity, because vacuum vapor cooling is perfectly feasible at the 45° F. to 90° F. temperatures commonly applicable to many air-conditioning projects. When a refrigeration engineer wishes to cool something, he "boils" or vaporizes a liquid refrigerant in close proximity with the substance which he desires to cool because the heat necessary to boil or vaporize the refrigerant will then be absorbed from the substance to be cooled, thus reducing the temperature.

The essential parts of a steam jet

vacuum cooling installation are six (See Fig. 4):

1. An evaporator or flash tank in which the warmed return water from the heat-exchanging apparatus is sprayed in controlled amount and from which the chilled water is withdrawn by a chill-water pump. The evaporator is held at a lowered pressure between 27 and 29 inches of mercury by the action of one or more steam-operated booster ejectors which draw off the evaporator water as flash vapor through a vapor offtake opening. The evaporation of approximately 1 per cent of the water introduced through these sprays draws its latent heat of vaporization from the remaining water, thereby reducing its temperature considerably. Chilled water can be produced in this flash tank at temperatures ranging from 35° F. to 55° F., depending upon the needs of the equipment and the amount of vacuum maintained in the tank.

2. One or more primary booster ejectors for the lowering of evaporator pressure and the transportation of the flash vapor to the condenser. A booster ejector consists of a venturi-shaped tube of cast iron having a vapor-offtake opening into the evaporator and a vapor-delivery opening into the condenser. At the vapor offtake there is located a steam nozzle through which a jet of steam travels, discharging into the venturi-shaped diffuser. The kinetic energy of the steam made available by the velocity reduction in the diffuser is used to reduce the evaporator pressure and to transport the flash vapor, compressing it to the primary-condenser pressure.

3. A primary surface condenser of the conventional type. This condenser consists of a shell within which are two cavities separated between walls of the tubes and the tube-heads. The flash vapor is introduced into one of these chambers. Through the other an adequate amount of condenser water is flowing. In this condenser, the heat of the flash vapor, as well as the heat from the steam of the jet, is extracted by the condenser water, producing a vacuum in the condenser, which assists the steam jet in maintaining the high vacuum in the flash tank. A primary barometric condenser of conventional type can also be used in place of the surface condenser where conditions and space requirements dictate.

4. A secondary condenser group consisting of miniature replicas of the primary booster and condensers. The purpose of this group is to remove the air and non-condensible gases from the primary condenser, compress them to atmospheric pressure and discharge them into the atmosphere. In the smaller sizes of steam jet vacuum cooling equipment, this secondary-condenser group is replaced by a mechanically-driven vacuum pump for practical and economical reasons.

5. Temperature controls are furnished consisting of motor valves for the closure of propelling steam and of water lines, of thermostats, vacuumstats, relays, and control rigs. Since even a slight reduction in the amount of propelling steam passing through the booster ejector nozzles destroys the ejector action, it is impossible to reduce the rate of cooling by throttling the steam supply. It is, therefore, necessary to keep the steam line entirely open or entirely closed. The control of chilled-water temperatures is obtained by a steam valve under the command of a chilled-water thermostat. This will automatically balance the load on the evaporator to the demand.

6. Pumps are required on a steam jet vacuum cooler to handle the chilled water, the condensate from the condensers, and the condenser water. Good engineering will dictate the choice of as high chilled-water temperature as is possible under the duty conditions.

The advantages of water as a refrigerant are its cheapness and its universal availability as well as its comparatively non-corrosive qualities with respect to materials and its absolute lack of toxicity for animal life. Because of these characteristics of water, the steam jet vacuum cooling system is free from all code and ordinance restrictions which hamper the chemical refrigerants. Those of you who are familiar wth the controversies which exist between refrigeration people and authorities in such cities as Chicago, New York, Washington, and Los Angeles will appreciate this point. So far as I know, this type of refrigeration equipment is the only method which is not being continually restricted by legislation.

Recent Improvements

Recent improvements in this equipment have permitted the use of low-pressure steam, which can be produced in heating boilers, with economies which will allow it to compete with other types of refrigeration. The equipment is built in innumerable sizes from five tons capacity up—even as high as 6,000 tons of refrigeration. Its rise probably will be confined to commercial and industrial applications.

The principle of absorption refrigeration like steam jet vacuum cooling affords the distinct advantage of providing both summer and winter air conditioning from the same source of energy — low-pressure steam. This combination of equipment has long been realized as having many advantages in air-conditioning work, but the method of refrigeration was precluded

(Continued on Page 36)

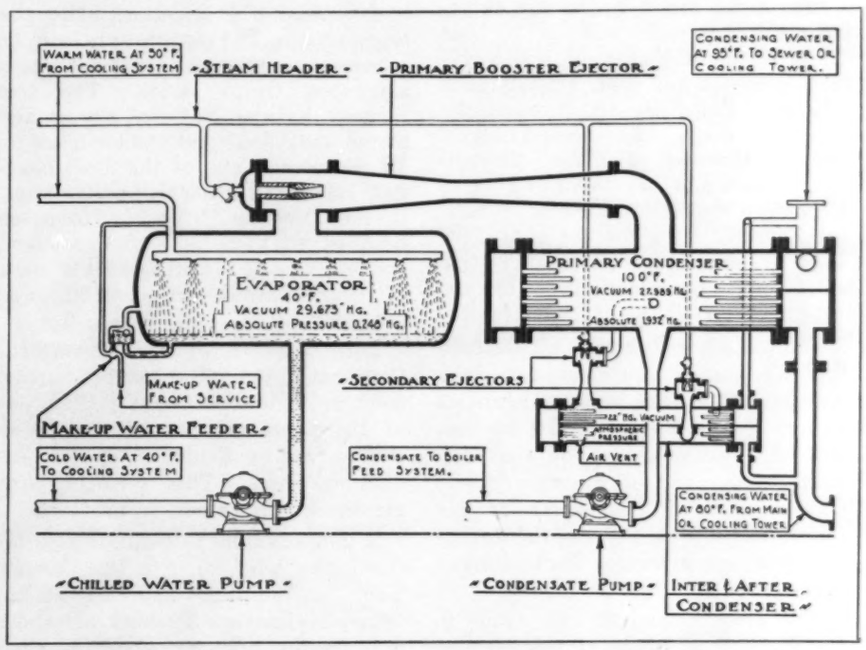

WARM WATER AT 50° F. FROM COOLING SYSTEM
STEAM HEADER
PRIMARY BOOSTER EJECTOR
CONDENSING WATER AT 95° F. TO SEWER OR COOLING TOWER.
EVAPORATOR 40° F. VACUUM 29.673" Hg. ABSOLUTE PRESSURE 0.248" Hg.
PRIMARY CONDENSER 100° F. VACUUM 27.989" Hg. ABSOLUTE 1.932" Hg.
MAKE-UP WATER FROM SERVICE
MAKE-UP WATER FEEDER
SECONDARY EJECTORS
COLD WATER AT 40° F. TO COOLING SYSTEM
CONDENSATE TO BOILER FEED SYSTEM.
AIR VENT
CONDENSING WATER AT 80° F. FROM MAIN OR COOLING TOWER
CHILLED WATER PUMP
CONDENSATE PUMP
INTER & AFTER CONDENSER

FIG. 4. Operating cycle of a steam jet-vacuum cooling air conditioning installation.

Stately ships dock in Smith Cove, Seattle, the city of the forthcoming convention.

VARIED PROGRAM SET FOR

A FULL program of entertainment and sports in addition to the valuable business sessions will mark the 44th Annual Pacific Coast Gas Association Convention in Seattle, August 17, 18 and 19. Banquets, dances, sports of all kinds, a golf tournament for delegates and a round of entertainment for the ladies who attend the Convention, have been planned by the committee in charge.

One of the highlights of the entertainment program will be a boat cruise Wednesday evening, which will take delegates and their friends on a trip over Puget Sound, through the great ship canal locks—second only in size to those at Panama—through Lake Union and Lake Washington to a picnic dinner and dance at beautiful Fortuna Park on the shores of Lake Washington. The return trip will be made by moonlight so that the delegates can see Seattle by night.

Paul Bunyan himself will attend the Wednesday luncheon for delegates. James Stevens, world-famous writer of the Paul Bunyan stories, will be guest of honor on that day and, making one of his rare public appearances, will tell some of his inimitable stories. The entire luncheon will be given a Paul Bunyan atmosphere.

The annual banquet and dance in the Spanish Ballroom at the Olympic Hotel will close the convention officially, on Thursday evening. Special programs are also planned for the Tuesday and Thursday group luncheons.

Delegates who wish to try their hands at deep sea fishing can arrange for special fishing parties during and after the convention. Tackle should be secured in Seattle.

A one-day trip to Mt. Rainier will also be arranged for delegates who wish to visit the Mountain after the Convention. The return trip can be scheduled so that delegates can catch afternoon trains South. The trip through Rainier National Forest and to the snowfields and glacier lakes on Mt. Rainier is one of the most beautiful on North America. Other trips, to the Olympic Peninsula, to ocean beaches, to Victoria and Vancouver, and to many of the other beauty spots of the Northwest can be arranged at the Convention.

Golfers will have their day at the Convention too. The annual tournament at Inglewood Country Club, one of the finest courses on the Coast, will be held on Friday after the Convention closes. This year a large number of prizes will be provided.

A full schedule is planned also for the ladies who come to the Convention. A reception and tea at the Olympic Hotel on Tuesday afternoon will be the opening event of their official program. Wednesday noon they will attend a luncheon at Inglewood Country Club. A putting contest and a scenic drive along beautiful Lake Washington Boulevard, through some of the fine parks and residential districts of Seattle, will follow the luncheon. This trip will return the ladies to the hotel in time to prepare for the evening boat trip, picnic supper and dance.

On Thursday a bridge luncheon at the Seattle Golf and Country Club is planned. It will be followed by a scenic drive along Puget Sound.

Thomas E. Roach, vice-president and general manager of the Washington Gas & Electric Co., Tacoma, is general chairman of the Convention Committee. The sub-committee chairmen and members assisting Mr. Roach are as follows:

Entertainment: E. J. Ludeman, Chairman; Frank Cadman, Archie Baddeley, Wallace Smith, Vail Schermerhorn.

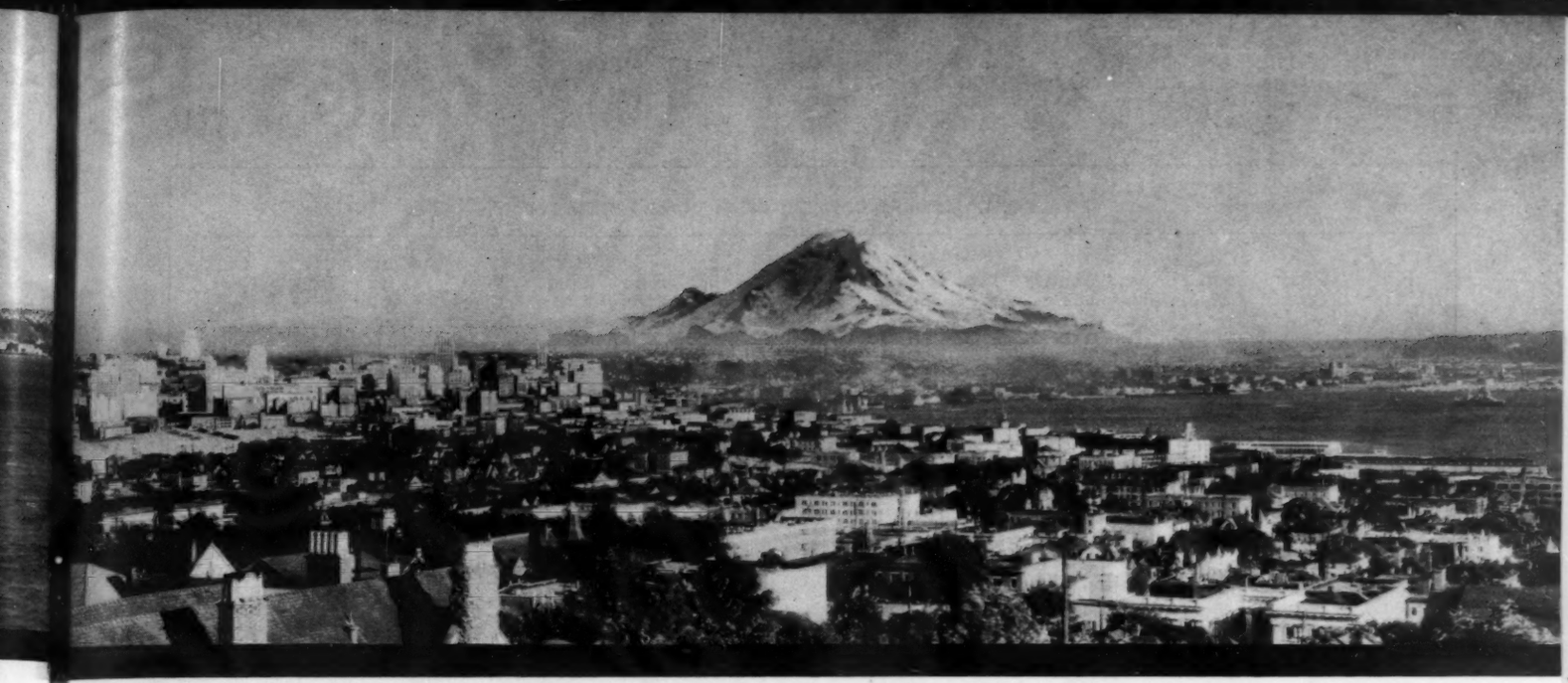
Banquet: Wilson Gaw, Chairman; R. D. Smith, Charles N. Larson.

Attendance and Reception: L. H. Steele, Chairman; L. A. Hewitt, A. E. Morrow, I. C. McGee, R. C. Alexander, J. R. Reynolds, William Gordon Rogers, M. C. Hancock, C. E. Lasher.

Hotel Accommodations: Chauncey Smith, Chairman; Don R. Faulkner.

Registration: Hyrum Crofts, Chairman; Carl Linde, M. W. Gibson.

Convention Newspaper: Frank Cad-



A trip to Mt. Rainier, which looms in the background, is planned for delegates.

44th P.C.G.A. CONVENTION

man, Editor-in-Chief; Fred Fisher, A. C. Joy, J. S. Spaulding, C. E. Lasher, Percy Black.

Properties: L. H. Steele, Chairman; Ernest Ludwig, Harry Lusk.

Appliance Display: I. C. McGee, Chairman; C. R. Basset, Phil Johnson, William P. French.

Publicity: Warren E. Kraft, Chairman; Norbert O. Fratt, Charlotte B. Smith, L. H. Steele.

Golf: R. W. Coblentz, Chairman; Allen Granstrom, Bob Keebler.

Transportation: L. S. Davis, Chairman; Vernon Damm, Mrs. Frances Stirrat, Fred J. Marty.

Hostesses: Mrs. James F. Pollard and Mrs. Thomas E. Roach.

Assisting at Tea and Bridge Party: Mrs. Frank Merris, Mrs. Frank Hawks, Mrs. E. J. Ludeman, Mrs. H. G. Horning, Mrs. P. R. Dunbar, Mrs. D. M. Faulkner.

The Awards Committee of the Association has just been appointed with Frank Talcott, Pacific Gas and Electric Co., as chairman.

The other members of the committee are: Frank Weiss of Southern California Gas Co., E. J. McCoy of Southern Counties Gas Co.; P. R. Dunbar, Seattle Gas Co.; George P. Egleston, H. R. Basford Co.; R. G. Logue, Ward Heater Co.; F. A. Hough, Southern Counties Gas Co., and P. E. Beckman, Pacific Gas and Electric Co.

Following is a general outline of the Convention program:

GENERAL SESSION

AUGUST 17—10:00 A.M.

Olympic Bowl

Paul Bunyan—The Colossus of the Lumber Camps — James Stevens, His Biographer.

Shoulder to Shoulder and All for the Gas Industry—James F. Pollard, President, Pacific Coast Gas Association.

Election of Officers.

Economics of Gas and Electric Competition — Herman Russell, President, American Gas Association.

PARALLEL SESSIONS

ACCOUNTING SECTION

AUGUST 17—2:00 P.M.

J. Q. Ewing, General Chairman
Southern California Gas Company

Address of Chairman.

Discussion of Timely Problems in General Accounting:

1. Payroll Accounting under Present-day Conditions.
2. Work Order Accounting.
3. Auditing Cost-plus Contracts.

SALES and ADVERTISING SECTION

AUGUST 17—2:00 P.M.

Bert W. Reynolds, General Chairman
Pacific Gas and Electric Company

Address of Chairman.

Following the opening remarks of the Chairman the Sales and Advertising Section will divide into the following committee meetings:

DOMESTIC SALES COMMITTEE ROUNDTABLE

AUGUST 17—2:15 P.M.

N. O. Fratt, Chairman
Seattle Gas Company

Meeting Oil Circulating Heater Competition—Harry A. Lee, Pacific Gas and Electric Co.

Resurrecting the Dead Service—E. J. Ludeman, Washington Gas and Electric Co.

Sales Rental Plan for Water Heaters —J. Wilson Gaw, Seattle Gas Co.

Modernizing Domestic Science Kitchens—R. W. Coblentz, Washington Gas and Electric Co.

COMMERCIAL AND INDUSTRIAL SALES COMMITTEE ROUNDTABLE

AUGUST 17—2:15 P.M.

R. T. Stephens, Chairman
Pacific Gas and Electric Company

Visual Commercial Cooking — Discussion led by R. W. Trowbridge, Seattle Gas Co. (This discussion will be illustrated by a display of counter cooking equipment.)

Heat Treating Equipment for Duralumin—E. H. Adler, San Diego Consolidated Gas and Electric Co.

Industrial Data Bulletins—Their Use

(Continued on Page 42)

TABLE NO. 1. CUBICAL CONTENT OF STANDARD STEEL PIPE

Ft. of Pipe Under Test	Pipe Size Inches	Cu. Cont. at Atmos.	Pipe Size Inches	Cu. Cont. at Atmos.	Pipe Size Inches	Cu. Cont. at Atmos.	Pipe Size Inches	Cu. Cont. at Atmos.	Pipe Size Inches	Cu. Cont. at Atmos.	Pipe Size Inches	Cu. Cont. at Atmos.	Pipe Size Inches	Cu. Cont. at Atmos.
200	¾	.7	1	1.2	1¼	2.1	2	4.8	3	10.3	4	17.7	6	40.2
250	¾	.9	1	1.5	1¼	2.6	2	6.0	3	12.8	4	22.1	6	50.2
300	¾	1.1	1	1.8	1¼	3.1	2	7.0	3	15.4	4	26.5	6	60.2
350	¾	1.3	1	2.1	1¼	3.6	2	8.0	3	17.9	4	31.0	6	70.3
400	¾	1.5	1	2.4	1¼	4.2	2	9.5	3	20.5	4	35.4	6	80.3
450	¾	1.7	1	2.7	1¼	4.7	2	10.7	3	23.1	4	39.8	6	90.4
500	¾	1.8	1	3.0	1¼	5.2	2	12.0	3	25.6	4	44.2	6	100.4
550	¾	2.0	1	3.3	1¼	5.7	2	13.1	3	28.2	4	48.7	6	110.4
600	¾	2.2	1	3.6	1¼	6.2	2	14.0	3	30.7	4	53.1	6	120.5
650	¾	2.4	1	3.9	1¼	6.8	2	15.5	3	33.3	4	57.5	6	130.5
700	¾	2.6	1	4.2	1¼	7.3	2	17.0	3	35.9	4	61.9	6	140.5
750	¾	2.8	1	4.5	1¼	7.8	2	18.0	3	38.4	4	66.4	6	150.6
800	¾	3.0	1	4.8	1¼	8.3	2	19.0	3	41.0	4	70.8	6	160.6
850	¾	3.1	1	5.1	1¼	8.8	2	20.0	3	43.5	4	75.2	6	170.7
900	¾	3.3	1	5.4	1¼	9.4	2	21.0	3	46.1	4	79.6	6	180.7
950	¾	3.5	1	5.7	1¼	9.9	2	22.6	3	48.7	4	84.1	6	190.8
1000	¾	3.7	1	6.0	1¼	10.4	2	23.8	3	51.2	4	88.5	6	200.8

Testing Old Mains and Services at Higher Than Operating Pressures

DURING 1935, a proposal was made by members of our organization to test mains and services by the application of high pressure, in conjunction with leakage mitigation work.

In the last 10 years, leakage work in our company has been gradually developed from a start made in 1926, until at present the isolation and measurement method is universally used throughout the entire system. Isolation valves are first installed in an area to be tested so that portions of the distribution system can be isolated. A meter is set up at a point where this section receives its gas and connections to this meter provided around the isolation valve.

Under this plan, it is possible, by shutting isolation valves and turning off consumers' meters, to measure gas into the area through a displacement meter, holding the pressure in the isolated area constant at the normal operating pressure, thus obtaining a direct measurement of the leakage in the area. After this initial test is completed, all above ground piping, meter sets, etc., or "overhead" as we call it, is thoroughly tested with soapsuds, and should the meter test mentioned above show leakage exceeding 240 M c.f. per mile of main per year, underground leaks are prospected for and all services are given a 15-minute, 50-pound stand-up pressure test. Services failing to pass this test are renewed.

After completion of this work, a final test is conducted similar in all respects to the initial test in that the area is again isolated, meters turned off and gas measured into the area through a displacement meter at normal operating pressure. This operation is carried on for 30 minutes and a constant pressure maintained during that period. A mercury column, or water column, as the case may be, is used for observing pressure and, in addition, a volumetric recording gage is attached so that a permanent record will exist.

A comparison of the two tests furnishes data as to the amount leakage has been reduced. If the final test shows leakage less than 240 M c.f. per mile of main per year, the crew moves on to another area. In practically all cases, the leakage left on moving from an area is much less than 240 M c.f. per mile per year. A complete record of cost is kept, and a comparison of this with leakage found and corrected gives a true picture of the value of this work.

This method of testing was satisfactory to the extent that it gave complete and accurate information concerning the amount of leakage existing at the time the leak crew left the job. However, due to the low distribution pressure that we normally employ (from 1½ to 6 lbs. pressure), we found that some mains that the leak crew found to be tight under these pressures were actually very badly corroded and in some cases started to leak badly within a few months after being tested. It was thought that, if mains and services could be subjected to a 75- or 100-lb. test pressure, any very thin areas would be blown out; and if these were repaired, we could feel fairly confident that the main would remain tight for a number of years.

Preliminary Work

A series of tests was carried out in suburban areas where high-pressure gas was available from transmission mains. In the cases chosen, an attempt was made to test areas where soil condition record and previous history indicated that weak points probably existed in mains or services which would yield when subjected to abnormal pressure. Our object was to locate and repair these weak points while the leakage crew was working in the area, thus avoiding the necessity of being called to

By E. R. AMES and W. L. McKEE

Southern Counties Gas Company*

W. L. McKEE

E. R. AMES

make a special trip in an emergency at a later date. Such a procedure would have the effect of locating weaknesses while looking for them and while equipped to properly handle them rather than to have a main or service give way when it was not expected, and when a crew might be at a point considerably remote from such a break. It also should eliminate many cases of leaking mains and services causing damage to trees and shrubs.

In the series of tests first undertaken, where high-pressure gas was not available from transmission lines, bottled gas was obtained and the containers arranged to feed in parallel. A number of sections of main were tested at pressures ranging up to 100 lbs. per sq. in.

The success of this experimental work resulted in the purchase during the summer of 1936, of a small compressor of 5,000 cu. ft. per hour capacity, so constructed that gas could be taken from a comparatively low-pressure main and raised by compression to a maximum of 80 lbs. per sq. in. This compressor was mounted on a trailer as shown in Fig. 1, and equipped with a silencer in order to allow its use at night in populated areas, and our experimental work continued under varied conditions.

Problems and Hazards

In undertaking this work, it was realized that many hazards existed and, at the outset, it was difficult to predict with any degree of certainty the exact results of applying the pressures used. In order to be prepared for these uncertainties, careful planning was done. Areas chosen were such that comparatively small sections could be isolated. An area was gone over carefully prior to a test and during the test a sufficient number of men was used to be certain that the area was well patrolled.

As the work progressed, the tests were gradually applied to more densely populated areas and eventually to downtown areas. Here it was found advisable to conduct the tests at night because of congested traffic conditions which existed during the daytime period.

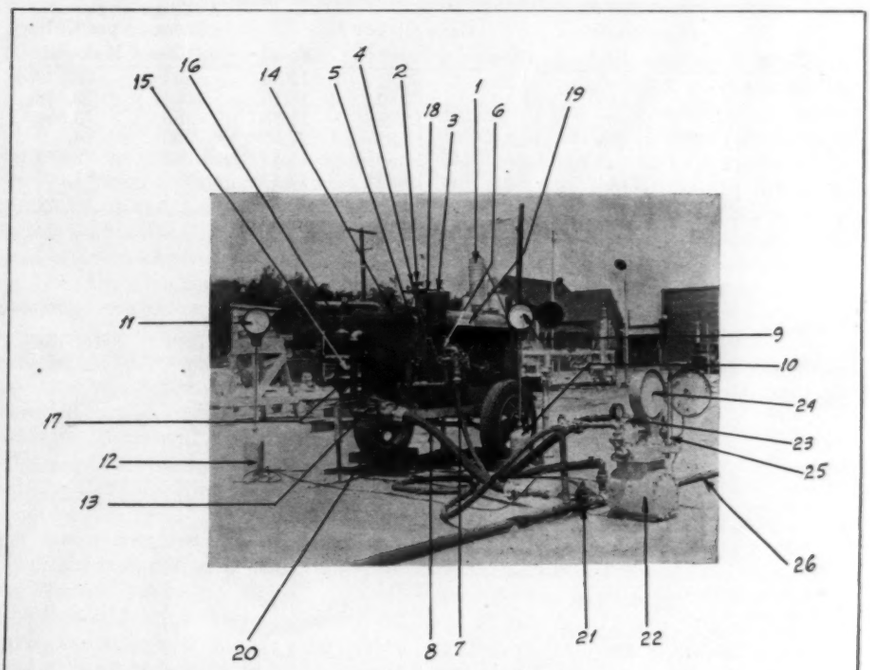
Method of Procedure

The following general outline of procedure is given as that productive of the best results to date. A sketch of all mains and services to be tested is first made in detail. Plug valves are installed where needed for the isolation of areas and all plug valves are properly lubricated before starting a test. All service lines are located with a pipe locator and also all mains in special rights of way or easements. All service pipe and mains under buildings are removed and necessary repairs and replacement work on above-ground meters and regulator sets are completed.

The cubical content of all mains and services at 0 gage pressure is calculated and a table made up for the convenience of foremen. (Table No. 1.)

The cubic foot loss for one pound drop in pressure is also calcuated (see Table No. 2). Test meter and com-

(Continued on Page 86)



1. Silencer
2. Relief Valve
3. Odorant Tank
4. Control Lever to valve on by-pass and valve on outlet line
5. Clutch Lever to engine
6. Odorant Flow Gauge
7. Outlet Line
8. Inlet Line
9. Outlet Gauge
10. Outlet Gauge Line Cushion
11. Inlet Gauge
12. Inlet Gauge Line Cushion
13. Inlet Control Valve Lever
14. Dust Trap
15. Back Pressure Regulator
16. Back Pressure Regulator Control
17. Regulator to Engine Supply Line
18. Gasoline Supply Tank
19. No Smoking Signs
20. Blocks for wheels
21. Isolation Valve
22. Displacement Meter
23. Meter By-Pass
24. Volumetric Recording Gauge
25. Mercury Column
26. Main Under Test

FIG. 1. Set-up for high pressure leakage work with displacement meter and compressor.

* To be presented before the Technical Section at the annual Pacific Coast Gas Association convention, August 17-19, 1937, at Seattle, Wash.

WINTER EXPERIENCES AND IN PRODUCING HIGH B. t. u.

DURING the last winter high B.t.u. oil gas was made in several stand-by oil gas plants in different sections of California and some new experiments were made in the operation of the plants to manufacture the gas. This brief report covers the results from the operation of three stand-by oil gas plants. The plants of the Los Angeles Gas and Electric Corp. and the San Diego Consolidated Gas and Electric Co. made the gas from Diesel oil. At the San Rafael Plant of the Pacific Gas and Electric Co., experiments were made using heavy fuel oil for the gas.

Experimental Runs on High B.t.u. Oil Gas by Pacific Gas and Electric Co.

During the first two weeks of February, this year, it was necessary to make a small amount of high B.t.u. oil gas each day at the San Rafael Plant of the Pacific Gas and Electric Co. As only a small amount of gas was needed, we decided to experiment on making it from fuel oil instead of the Diesel. The small 9-foot diameter by 30-foot 5-inch high single shell down blast generator was fired up to make the tests. This generator contains 3,310 checker brick in a single stack 13-foot 11-inch high. It has a rated capacity of 23,000 cu. ft. of 550 B.t.u. gas per hour based on 12-minute cycle.

The gas was passed through one primary and two secondary scrubbers to the relief holder. Due to the large capacity of the scrubbers and relief holder, it was impossible to get an average B.t.u. of the gas until considerable gas was made in the relief holder. As we wanted the average B.t.u. every few runs, a fan type booster was installed in the outlet of the last secondary scrubber and the gas circulated back to the first secondary. The pipe line to the Thomas calorimeter was connected to the scrubber manifold. This method proved very satisfactory in getting the average B.t.u. every few runs.

It was thought that the use of fuel oil for making high B.t.u. oil gas in an oil gas generator would cause considerable trouble with carbon deposits on the checker brick but this did not prove true during the tests, as practically all the carbon was consumed in heating the generator during the heat and dry blow. It was noticed that after starting the generator in the morning and making several runs, the increase in temperature of the lower section of checker brick would reduce the B.t.u. and a small amount of carbon would show on the checker. Any increase in the make oil used to increase the B.t.u. did not lower the temperature in the bottom section of checker brick, but caused the generator to show considerable smoke when the run was pulled off as the extra oil plus the steam purge cooled the top courses of checker too much.

As the generator was not equipped with a reverse blast to force the heat

TABLE NO. 1. RESULTS OF DAILY RUNS

Date	Gas Made Cu. Ft.	Gals. Oil per M			Average B.t.u. of Gas	B.t.u. per Gal. Make Oil
		Heat	Make	Total		
February 8	89,467	1.20	11.54	12.74	897	77,729
9	78,844	1.39	13.80	15.19	1006	72,898
10	110,473	1.49	13.26	14.75	980	73,906
11	67,628	1.57	12.52	14.09	928	74,121
12	45,440	2.07	13.50	15.57	985	72,963
15	70,551	2.14	10.27	12.41	835	81,305
16	110,625	1.65	10.22	11.87	774	75,734

TABLE NO. 2. B.t.u. OF GAS ON COMPRESSION

Atmos. Press.	1 lb.	25 lbs.	50 lbs.	75 lbs.	100 lbs.
946	935	920	901	890	880
1033	1015	993	978	969	964
850	No test	829	808	795	794
777	No test	749	736	728	727
749	732	718	706	703	699
No test	700	668	666	657	656

TABLE NO. 3. ANALYSES OF FUEL OIL GAS

Carbon Dioxide CO_2	2.5	2.6	1.8	1.8
Benzene Vapor C_6H_6	1.9	1.4	1.0	0.8
Heavy Hydro Carbon C_nH_{2n}	22.2	16.5	11.7	7.9
Carbon Monoxide CO	1.4	2.9	2.5	3.8
Oxygen O_2	0.4	0.4	0.4	0.5
Hydrogen H_2	9.5	13.5	25.4	34.7
Methane CH_4	53.7	53.1	51.2	45.2
Nitrogen N_2	8.4	9.6	6.0	5.3
B.t.u. Calculated	1121	1021	895	781
Specific Gravity	.709	.667	.556	.494

TABLE NO. 4. OIL ANALYSES

	L.A.G.&E. Corporation		S.D.C.G.&E. Company	P.G.&E. Company
	Diesel Oil	Fuel Oil	Diesel Oil	Fuel Oil
Gr. Degrees A.P.I. at 60° F.	35.0	17.1	30.6	16.5
Flash point, Cleveland Open Cup	175° F.	193° F.	225° F.	215° F.
Fire point, Cleveland Open Cup	225° F.	...	260° F.	275° F.
B. S. & W. Centrifuge,%	Tr	0.9	0.05	0.8
Sulphur, % Wt.	0.36	1.22	0.322	0.439

EXPERIMENTS OIL GAS

J. E. KELLEY

C. W. BECK

M. J. CEREGHINO

THIS CHRONICLE OF the experiences of California Gas companies in manufacturing high B.t.u. oil gas during the cold periods of the past winter has been jointly prepared by C. W. BECK, foreman of the gas works and M. J. CEREGHINO, engineer, of the Los Angeles Gas & Electric Corp. (now Southern California Gas Co.); R. A. CHAMBERS, assistant superintendent of gas production, San Diego Consolidated Gas & Electric Co.; and J. E. KELLEY, assistant engineer, the Pacific Gas and Electric Co. This paper is to be presented before the Technical Section at the Annual Convention of the Pacific Coast Gas Association at Seattle, Wash., August 17–19, 1937.—Editor.

from the bottom to the top courses of checkers, it was decided to put some steam in the checkers below the top courses. About four feet below the top courses of checker brick there was a sight cock in which a steam pipe was connected and steam was introduced to reduce the temperature of the lower courses of checker brick and to purge the generator. After a few runs the generator stack gases cleared much better, but it took some experimenting to find the proper temperature to hold in the bottom section of checker brick for the B.t.u. that was desired.

The runs were not confined to making gas of the same B.t.u. every day. Some tests were made to determine how low a B.t.u. gas could be made without showing any carbon in the washbox seal. From these tests it appeared that the lower limit was about 740 B.t.u. In all these tests the amount of make oil per run was kept about constant. The heat oil and the bottom temperature (with steam) were varied to get the B.t.u. wanted. It appeared from all the tests on different B.t.u. gases that the generator worked better and was easier to control when making around 800 B.t.u. gas. This may be due to the experience gained in getting better control of the heats during earlier tests on higher heat value gases. Table No. 1 gives the results of each day's run. This table shows considerable variation between maximum and minimum B.t.u. which was due to experimenting in attempting to get the heats under control for the B.t.u. wanted. Due to part of the light tars running off in the water, it was impossible to get an accurate measurement of the tar made.

It appeared from the tests on this generator that if we could crack the fuel oil on a few courses of checker brick at a higher temperature, and then put the gas through a stack of checkers at a lower temperature, then vary the temperature of the second stack of checker, we could make any B.t.u. of oil gas from 740 to 1,100 with fuel oil and not have any carbon show at the washbox seal. One method of doing this on a down blast single shell generator would be to have the stack of checkers in two sections so oil could be fed to both sections. As most of the carbon collects on the first courses at the top, a reverse blast would keep the carbon burned and keep the generator heated.

During the test on high B.t.u. gas from fuel oil, we made a great many runs without heat oil but this had a tendency to cool the top courses of checker brick and increase the temperature of the lower checker due to the down blast. This would cause the generator to show considerable smoke as the top checker was too cold to properly crack the oil.

Light tar flowed from the washbox seal on all tests from about 800 B.t.u. up, but below 800 B.t.u. the tar was heavier and contained a greater amount of carbon.

As in the case of high B.t.u. oil gas made from Diesel oil, there is a considerable drop in the B.t.u. of the gas when compressed. Table No. 2 gives the compression tests made on the fuel oil gas.

We would have liked to carry on further tests but due to the short time it was necessary to make gas it would hardly justify the expense of making changes in the generator to get better heat control. The tests have not given us a definite conclusion on making high B.t.u. oil gas from heavy fuel oil but has given us a good start for future work and has aided materially in clearing up some facts that were in doubt.

The indications are that fuel oil can be used for high B.t.u. oil gas in a typical oil gas generator, provided certain changes in arrangement of checkers are made, steam purge lines are added below the top of the make chamber checking and up blast added. Just how much blue gas may be obtained from the reactions of steam upon the carbon on the checkers is still unknown as it was not possible to continue the test further. Since the steam did clean the checkers it is likely that a fair per cent of blue gas could have been produced and trapped in the make gas instead of permitting it to escape in purge and blast gases as was necessary during this test.

Analyses of oils used by the three different companies are given in Table No. 4.

High B.t.u. Oil Gas By Los Angeles Gas and Electric Corporation

The No. 3 plant of the Los Angeles Gas and Electric Corp. was called on to make 1,000 B.t.u. and 0.71 specific gravity gas at the rate of 48 million cu. ft. per day. Some days only 2 to 4 million cu. ft. were made, with a peak make one day of 20 million cu. ft. in 8 hours. This was due to the domestic and commercial sendout increasing from an all time peak of 138.4 million cu. ft. on December 14, 1931, to a peak of 183.5 million cu. ft. on January 22, 1937.

This plant consists of 10 single shot type generators with up blast and down make. The generators are 27 ft. in diameter by 43 ft. high and each shell contains between 65,000 and 72,000 checker brick. The 10 shells have a rated capacity of 40,000,000 cu. ft. of 550 B.t.u. gas per day. Each shell has its own wash-

box from which the gas passes through four water scrubbers and one oil scrubber, thence into the relief holder. From the relief holder the gas passes through six oil scrubbers and three purifiers to the 60-inch collection main which connects to the storage holders.

The generators had been preheated with natural gas or fuel oil since December 8, 1936, to a temperature of 1100° F. This temperature is maintained by regular heats in each shell every two hours. The amount of fuel used per heat per shell is 40 gallons of fuel oil or 5,000 cu. ft. of natural gas. Just before starting to make Diesel oil gas the temperature of the checker brick is raised to 1300° F.

Eight minutes blast and 12 minutes make were the cycles of operation used. The Diesel oil is heated to 210° F. and steam is used to atomize the oil for spraying on the checker brick. It takes nine minutes to inject the make oil and during this period no other steam is used. After the make period the oil loop and injectors are purged out with steam for 1½ minutes. Then for 1½ minutes the generator is purged with steam through a 3-inch loop which purges out the gas left in the shell after each make period.

After the first three hours of operation, the make oil was held at 800 gals. per run and the heat oil increased or decreased in order to hold the B.t.u. as close to 1,000 as possible. The B.t.u. did not vary over 25 B.t.u. and was controlled by the plant engineer watching the washbox seals. The density of the gas varied between .64 to .68. After 12 hours' operation the checker brick were clean and free from carbon.

The results of Diesel oil operation are as follows:

1. The No. 3 plant of 10 shells has a capacity of 48 million cu. ft. of high B.t.u. oil gas per day. It will take three and one-half hours to bring the plant to three-fourths capacity and five hours to reach a 48-million-cu. ft. rate.

2. The overall rate of 11.3 gals. of make oil per M cu. ft. of 988 B.t.u. gas made are required under conditions encountered in short periods of making gas. Under steady operating conditions this figure might be reduced to 11.0 gals. per M for 1,000 B.t.u. gas.

3. A ratio of one gal. of fuel oil to 10 gals. of make oil was obtained, but under continuous operation the fuel oil could be reduced 25 per cent.

4. The B.t.u. of the gas and operation of the generator can be maintained by observing the nature of the tar produced on the washbox seal. An experienced operator can control the B.t.u. of gas within 50 B.t.u.

5. The results of this Diesel oil operation seem to indicate that a gas between 1,000 and 1,050 B.t.u. is more desirable to manufacture because the tar is a liquid easy to handle and burn. When the B.t.u. approaches 900 the tar is mixed with so much carbon that the mixture is difficult to handle with a pump or shovel.

6. Yield of tar with 1,000 B.t.u. gas was 2.3 gals. per M. About 75 per cent of the tar is separated out in the washbox and 25 per cent in the regular water scrubbers.

7. Naphthalene content is considerably lower than in the manufacture of 550 B.t.u. oil gas. The hydrogen sulphide was readily removable at the ordinary loads. However, when purifiers overloaded 67 per cent, the lead acetate test showed a trace.

8. Chemical analyses of Diesel oil gas made:

	12-30-36	1-22-37
Carbon dioxide CO_2	3.9	2.2
Illuminants C_nH_n & C_2H_2	9.8	13.6
Oxygen O_2	0.3	0.2
Hydrogen H_2	19.2	21.8
Carbon monoxide CO	3.2	3.6
Ethane C_2H_6	2.2	2.1
Methane CH_4	57.0	54.3
Nitrogen N_2	4.4	2.2
	100.0	100.0
B.t.u. Calculated	940	1,019
B.t.u. Calorimeter	930	1,005
Specific Gravity as Sampled	0.755	0.685

Calendar

August

Michigan Oil and Gas Exposition—Mount Pleasant, Mich., August 10-15.

Pacific Coast Gas Association—Olympic Hotel, Seattle, Wash., Aug. 17-19.

September

American Gas Association—Cleveland, Ohio, week of September 27.

Midwest Section, National Bottled Gas Association—Cleveland, Ohio, sometime during week of September 27.

October

Chicago Exposition of Power and Mechanical Engineering—New International Amphitheater, Chicago, Ill., October 4-9.

American Society for Metals—1937 Metal Congress and Exposition, Atlantic City Auditorium, Atlantic City, N. J., October 18-21.

National Bureau of Standards—Conference on Corrosion and Protection of Pipe Lines, National Bureau of Standards, Washington, D. C. In October. Definite date to be announced later.

Mid-Continent Oil & Gas Association of Texas—Dallas, Texas, October 29-30.

November

American Petroleum Institute—Stevens Hotel, Chicago, Ill., Nov. 9-12.

Seventeenth Annual Gas School Conference—Iowa State College, Ames, Iowa, Nov. 10-13.

February, 1938

New England Gas Association—Hotel Statler, Boston, Mass., Feb. 24-25.

Summary of entire Diesel oil operation:

Average B.t.u.	988
Average Specific Gravity	0.715
Gallons Make Oil Used	589,176
Gallons Make Oil per Hour Average per Shell	1,295
Gallons Make Oil per Hour at Full Load Shell	2,400
Gallons Make Oil per M	11.6
Gallons Fuel Oil Used	61,152
Gallons Fuel Oil Used per Hour Average per Shell	134.4
Gallons Fuel Oil Used per Hour at Full Load per Shell	240.0
Gallons Fuel Oil Used per M	1.2
B.t.u. Gas Made per Gallon Make Oil	87,434
B.t.u. per Gallon of Make Oil	140,140
Gallon Tar Produced per M	2.3
B.t.u. per Gallon of Tar	134,900
B.t.u. in Tar Made per Gallon Make Oil	26,750
B.t.u. Make Oil Consumed in Shell per Gallon Make Oil	35,956
Per cent of Make Oil Converted Into Gas	62.4
Per Cent of Make Oil Converted Into Tar	19.1
Per Cent of Make Oil Consumed in Shell	25.7
Cost of Make Oil per M of Gas Made	$0.347
Cost of Fuel Oil per M of Gas Made	$0.025
Cost of Fuel and Make Oil per M of Gas Made	$0.372
Steam Used, lbs. per M Gas Made	10.0
Hydrogen Sulphide in Raw Gas, Grains per 100 C.F.	26.7
Heat Period in Minutes	8
Make Period in Minutes	12
Gallons Make Oil per Shell per Run at Full Load	800
Gallons Fuel Oil per Shell per Run at Full Load	80
Duration of Diesel Oil Operation in Hours	45.5
Total Gas Made M c.f.	50,646
Average Gas Made M c.f. per Hour	1,113
Maximum Capacity M c.f. per Hour	2,000
Time Required to Approach ¾ Rate Capacity in Hours	3.5
Time Required to Approach Rated Capacity in Hours	5.0
10 Shell Output in M c.f. per Hour at Rated Capacity	2,000
10 Shell Output in M c.f. per 24 Hours at Rated Capacity	48,000

High B.t.u. Oil Gas By San Diego Consolidated Gas and Electric Company

On December 2, 1936, the San Diego Consolidated Gas and Electric Co. operated their 18 ft. 9 in.-diameter 2-shell Jones generator at San Diego. The primary shell on this generator is 43 ft. high and contains approximately 17,380 checker brick. The secondary shell is 53 ft. high and contains 27,745 checker brick. This generator was operated with Diesel oil for heating and make. It has a rated capacity of 5 million cu. ft. of 550 B.t.u. gas per day.

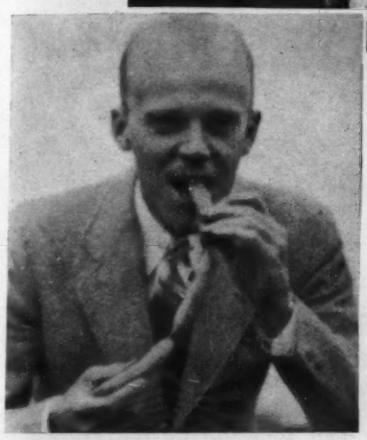
The gas, after leaving the washbox, passes through three salt water scrubbers and one double Steere washer to the 500,000 cu. ft. relief holder. The

(Continued on Page 34)

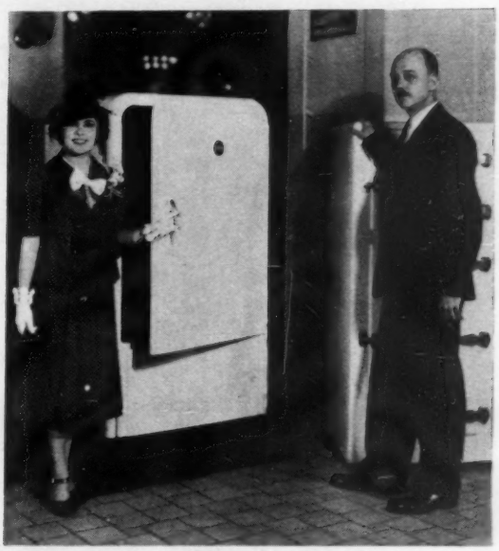
GAS CAMERA

MAKING GOOD USE of opportunity, Mary Carlisle, featured in Paramount's film "Hotel Haywire," brought her lunch to the set during production and kept it in the Servel refrigerator used in the picture. Here she is offering to share with John Patterson, while Director George Archainbaud looks on with interest.

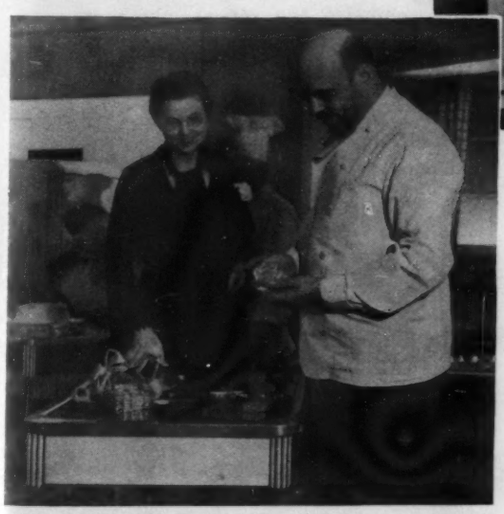
THRIFTY VAN PENNY (center), new trade character of Wisconsin Public Service Corp., poses with A. C. Roehl, research (left), and Dale Remington, advertising manager. Van Penny traces his ancestry back to van Helmont, discoverer of gas.



IT'S DONE in the best gas circles. W. H. Relyea, advertising department, The Foxboro Company, Boston, set hot-dog styles at the Technical Advertising Association outing at Plymouth, Mass.



MRS. MARTIN JOHNSON (above), noted motion picture explorer, inspects the millionth Servel Electrolux gas refrigerator displayed at the salesroom of the Consolidated Edison Co., New York City. With Mrs. Martin is N. T. Sellman, assistant vice-president in charge of sales of Consolidated Edison. AT LEFT: A sad appeal is made for the Unsold and Minimum Bracket Customers by Hugh Lumpkin (left) and Will Huntley, Mississippi Power & Light Co., Jackson.



AT A DEMONSTRATION held by The Peoples Gas Light and Coke Co., Chicago, Cyrielle Dumuyt, pastry chef at the Stevens Hotel, wove a basket of spun sugar. Miss Karen Fladoes, home service director, looks on. Back of them are chefs from the Blackstone and Auditorium.

DURING THE JUNE BRIDE sales promotion conducted by Grand Rapids Gas Light Co. in Grand Rapids, Mich., with 75 dealers co-operating, a float with a pretty girl and a Magic Chef range toured the streets daily. A letter contest and a window display contest were also features of the campaign.

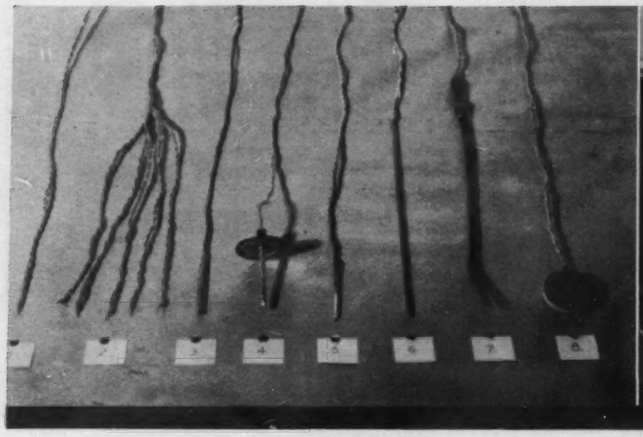


FIG. 1. Thermocouples used for various applications in laboratory testing procedure.

FIG. 2. Thermocouples used in determining top burner heat distribution.

GAS COMPANY APPLIANCE TESTING

ABOUT two years ago the need was felt for a gas appliance testing laboratory to cooperate with the various departments of the three affiliated companies in the Los Angeles area (now two companies) in obtaining appliance test data to (1) assist service departments, (2) assist sales departments, (3) evaluate new devices as they appear and (4) evaluate competitive equipment, with the result that the present laboratory now exists as a joint organization.

Facilities

The laboratory is equipped in a measure along the line of the A.G.A. Testing Laboratories. Suitable manifolding is provided for simultaneous tests of approximately 15 gas appliances. There are several outlets for electrical appliance testing. Pyrometers, potentiometers, wet test meters, thermometers, draft gages, pressure gages, weighing tanks and orsats are included as test equipment. An iodine pentoxide apparatus for the detection of small concentrations of carbon monoxide and a portable MSA carbon monoxide indicator aid in combustion tests. Suitable hoods for the collection of representative combustion samples are available. Thermocouples for the measurement of surface temperatures, broiler rack heat distribution, average oven temperatures, spot temperatures, top burner heat distribution, meat temperature, and the internal temperature of fruit jars are available. A completely equipped test kitchen for the combined use of the laboratory staff and the home service departments is provided. The kitchen may be used also as a controlled elevated temperature room or a closed room for space heater combustion tests.

The laboratory has a testing floor space of 2,600 square feet. Additional space is provided for the testing of large industrial or commercial equipment, office space of 900 square feet is provided for stenographic, drafting, report and bulletin composition and engineering detail work.

Three graduate engineers compose the permanent testing staff while five selected gas distribution service men are rotated between the field and the laboratory. At least two of the service men are in the laboratory all the time so that current field problems are always known to the laboratory staff. Representatives of the home service department are available at all times for test or research work. The necessary clerical and supervisory man power completes the staff.

The primary requisite of all appliances financed and merchandised by the operating companies is that they bear the A.G.A. seal of approval, but since the A.G.A. requirements are of necessity minimum requirements, laboratory investigations start at that point and go further. Safety, durability of construction, maximum performance, ease of operation from the customer's standpoint, accessibility of controls for servicing and detailed examination of new devices comprise the major part of the testing procedures.

No basic standards are set up but appliances shown to be below the average in quality and performance by laboratory tests are brought to the attention of the manufacturer who is urged to improve his product.

The reports are written by members of the staff and approved by the research engineer of the company. Pictures or sketches of pertinent details are included in the reports. A general description of the appliance tested, together with performance data, difficulties encountered, recommendations for improvement and general comments comprise the report which is distributed to the sales departments and distribution departments for dissemination of pertinent data. The manufacturer of the appliance also receives a copy for his confidential information.

Testing Procedures

Work sheets are provided for all appliances to aid the test engineer in investigation of all details. These sheets are filed for future reference after the report is summarized from them. The test procedure for gas ranges is outlined below.

The gas range test procedure is divided into two parts; first, the laboratory investigation and second, comments by the home service department who examine the range when installed in the test kitchen.

● THIS TREATISE BY R. I. SNYDER, Southern California Gas Co., Los Angeles, Calif., portions of which are herewith published, deals with the gas company testing laboratory from the standpoints of its facilities and testing procedures. The September issue of GAS will present a further discussion of the company laboratory by R. V. DAVIS of the Southern California Gas Co., who will approach the topic from the viewpoint of the laboratory's utility to the company sales department. The reports of both Mr. Snyder and Mr. Davis are parts of a paper, "Gas Company Appliance Testing Laboratories," which is to be presented before the Technical Section at the Annual Convention of the Pacific Coast Gas Association, at Seattle, Wash., August 17-19, 1937.—(Abstract by GAS).

FIG. 4. View of laboratory test kitchen used by home service representatives for routine testing or research.

LABORATORIES

Laboratory Inspection

Visual examination and detailed inventory:

1. Make, type, model and overall dimensions.
2. Description of utensil compartments.
3. Venting.
4. Detailed description of top burners, oven and oven burner, controls, (thermostat, clock, safety device, etc.), broiler and broiler burner.
5. Detailed description of accessibility of controls for servicing, ease of operation from customer's standpoint, possibility of damage to various parts due to normal usage.

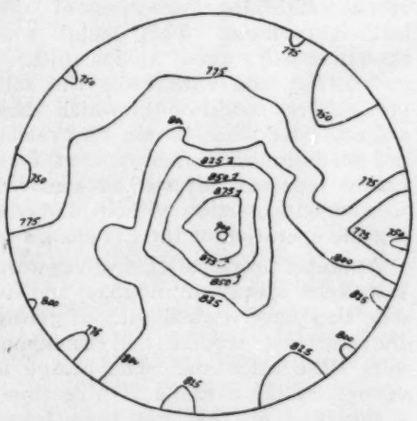


FIG. 3. Typical top burner temperature distribution isotherm chart. Isotherms are determined by spot temperature readings taken with thermocouples embedded in 7½-in. diameter steel plate placed over the burner.

6. Type of gas tubing used (size, material and joint).
7. Criticisms of instructions furnished.

Performance:

1. Oven—(a) Proper adjustment of ignition system. (b) Determination of maximum safe input. (c) Oven operation at maximum safe input (time and input to reach and maintain dial settings). (d) Oven heat distribution.
2. Broiler — (a) Determination of maximum safe input. (b) Heat distribution tests.
3. Total pilot consumption.
4. Top burners — (a) Determination of maximum safe input of each type of burner. (b) Thermal efficiency at maximum safe input. (c) Heat distribution tests. (d) General performance (ignition, flame characteristics, flashback, burner extinguishment and minimum safe turn down.
5. Surface temperatures and fire hazard.
6. General comments.

Home Service Examination

General examination (appearance, arrangement of top section, ease of cleaning, accessibility, objectionable features, good features and miscellaneous comments).

Standard cooking tests include biscuits, cakes (four layers at once), and pies.

Gas Space Heaters, Water Heaters and Miscellaneous Appliances are tested with similar detail.

Research and Development

Frequently problems involving fundamental research are encountered in the laboratory and dealt with accordingly. Several instruments for field use have been developed or improved. Fundamental design of various gas appliance burners and construction have been studied and the information relayed to all manufacturers of such appliances.

Fig. 1 illustrates the various applications of thermocouples to laboratory work of this nature. Thermocouple 1 is a single junction couple for spot temperatures. No. 2 is a five parallel connected couple for the determination of average gas range over temperatures, for example. Thermocouple 3 is used for surface temperature measurement. No. 4 is a special thermocouple for the determination of temperature inside a fruit jar during oven canning. No. 5 may be inserted into a roast of meat to determine the relationship between internal meat temperature and "doneness of meat." Thermocouple 6 is also a special type used to check fat temperatures in deep fat fryers. No. 7 is similar to No. 6 and is used in water heater tests for determination of water temperature at or near the sensitive element of the thermostat. Thermocouple 8 is for the determination of broiler rack heat distribution and is painted black to absorb radiant energy. Nine of these are usually equally spaced on a broiler rack.

Fig. 2 illustrates another application of the thermocouple in determining top burner heat distribution. Thirteen thermocouples are embedded in one quadrant of a steel plate 7½ in. in diameter and individual temperatures may be noted by means of the switch box located above the plate. The plate may be rotated through the four quadrants to obtain a complete temperature traverse after which an isotherm chart may be drawn showing the complete distribution of heat (see Fig. 3).

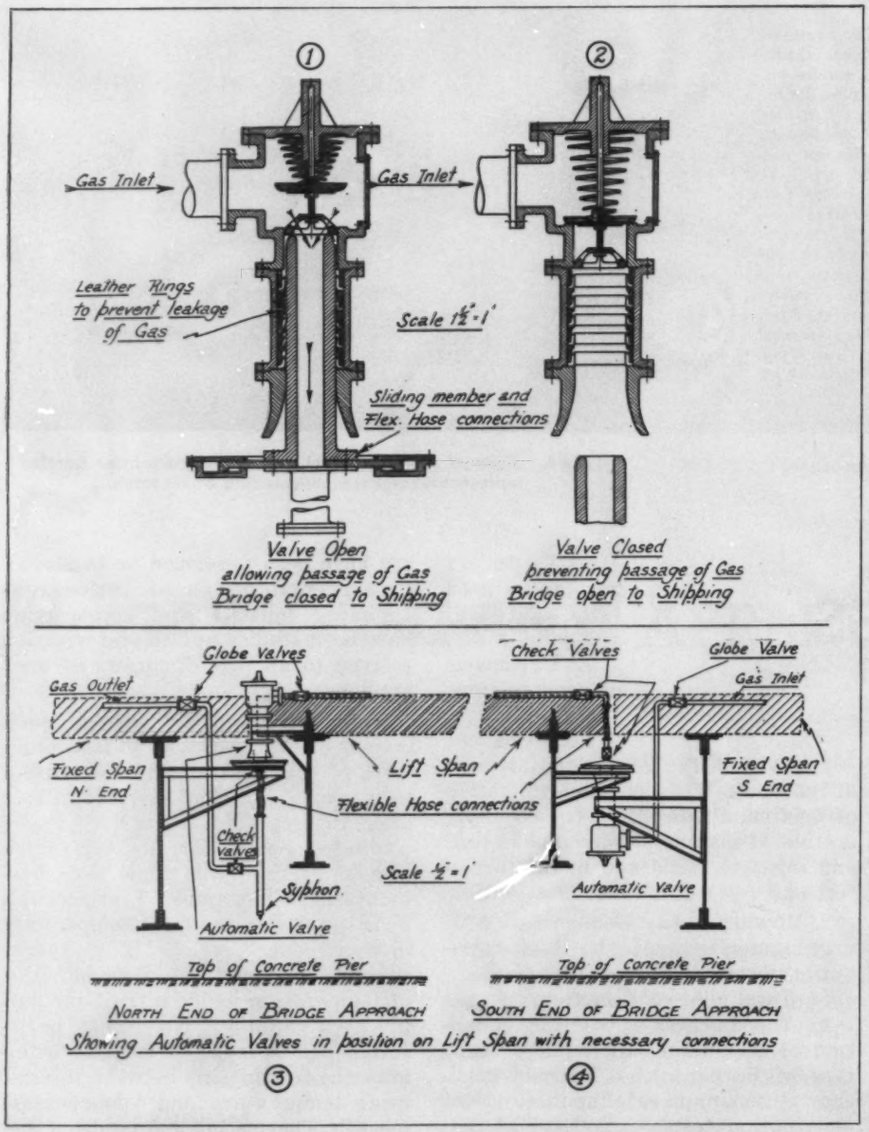


FIG. 1. Diagrams of the automatic valve installed by B. C. Electric Power and Gas Co. on a 300 foot lift span bridge. Drawings 1 and 2 show the automatic joint when open and when closed. Drawings 3 and 4 show the method of installation.

Use of Automatic Valves On a Lift Span Bridge

IN July 1934 engineers of the gas department of the B. C. Electric Power and Gas Co. were faced with a somewhat unusual gas distribution problem in supplying gas to North Vancouver, a city with a population of approximately 14,000, separated from the gas works proper by the Burrard Inlet, a body of water which is nearly three miles across at its widest spot. This inlet narrows to about 3,000 odd feet and is crossed at this point by a bridge known as the Second Narrows' Bridge.

At the point where the bridge is built there is a tidal current which runs at time as fast as 10 knots according to the variation of the tides.

After very careful consideration and in view of the physical difficulties and high capital and depreciation costs of a submerged gas main it was decided to use the bridge and on the lifting span section adopt the automatic joint. This system calls for the use of two automatic valves and is the first and only installation of its kind in the world to be used by a gas company in the distribution of its product.

Very little difficulty was met in laying the main across the bridge, the pipe being placed on the steel work close to the railway ties on the east side. On each end of the 300 ft. lift span was installed an automatic joint. When the bridge span lifts for the passage of a vessel the joints come apart and the gas supply to North Vancouver is automatically cut off. This does not affect the supply to the consumer for the demand is taken care of by the storage of gas in a Hortonsphere holder on the North Vancouver side. When the lift span is brought to the level the joints automatically couple themselves, opening valves and permitting gas to flow from the city plant to the North Vancouver shore.

These joints involve a special system of packing, assuring them gas tight. They have been tested to 125 pounds water pressure and 75 pounds air pressure without any sign of a leak. They have also another special feature, or section, which slides in a bath of oil, taking care of any expansion or contraction of the bridge through changes in temperature.

The valves are made entirely of bronze with the exception of the leather packing. This metal was chosen as being proof against pitting or rusting, and withstands the salt atmospheric condition to which they are subjected when in use. The valves are so designed, moreover, that they can be repaired, adjusted or removed in part or in section without disturbing the operation of the lift span.

As stated previously the valves were placed in operation in 1934 and to date they have worked without giving the slightest trouble and requiring very little attention. The bridge is opened on the average of nine times a day and all that has been found necessary to do is to give the valve leathers an oil dressing every once in a while and also replenish any oil which may be lost or used in the sliding pan or bearing which takes care

● **F. E. REED, B. C. Electric Power and Gas Co., Ltd., Vancouver, B. C., in a paper, "Automatic High Pressure Valves on a Three Hundred Foot Lift Span Bridge," to be presented before the Technical Section at the Annual Convention of the Pacific Coast Gas Association at Seattle, Wash., August 17-19, 1937.—(Abstract by GAS).**

of the expansion or contraction of the bridge through changes in temperature.

Fig. 1 explains the operation of these valves. This drawing has been divided into four sections 1, 2, 3, and 4 and by referring to Fig. 1, Sec. 1, it can be seen how the two halves of the joint are joined together when the bridge is in position and the gas is passing through the main.

It will be noted that the entering member as it slides inside the fitting lifts a valve from its seat and by so doing permits the gas to pass through the joint. The entering member is made gas tight by reason of the fact that it passes through several hydraulic cup leathers.

Any variation or changes in position that may occur through perhaps contraction of the bridge or general play is taken care of by the fact that the end of the entering member is rounded or tapered and the outer member flared. The one half of the joint is supported on a plate which slides in a bath of oil and gives it more than 3 inches of play in a circular vertical position.

Valve Position

By referring to Fig. 1, Sec. 2, you will note the position of the valve when the bridge has started to lift. When it becomes disjointed or the entering member is drawn out, the valve inside the fitting has automatically closed and is kept gas tight by the spring and also the gas pressure which is behind it. When the joint has come apart and the valve inside has seated itself, stopping the flow of gas, the gas is prevented from coming back from the other half of the joint by ordinary standard check valves. In other words, gas is only allowed to pass in one direction and any gas which is in the main on the lifting span of the bridge cannot escape because at one end it is held back by an ordinary standard check valve and at the other end by the automatic valve. This same system of course applies to the two opening ends of the bridge.

By referring to Fig. 1, Secs. 3 and 4, you will see how the joints are set up on the bridge, and as stated previously, on a double-lift bridge two automatic joints are required, one set in the reverse position to the other. If for instance this valve principle was adopted on a single-lift bascule bridge only one joint would be required and on the hinge section of the bridge a section of flexible piping would be necessary.

The Natural Gas Engine and Potential Business

● **MANLEY H. CLARK, Southern Counties Gas Co., Los Angeles, Calif.; in a paper, "Potential Natural Gas Engine Business," to be presented before the Technical Section at the Annual Convention of the Pacific Coast Gas Association at Seattle, Wash., August 17-19, 1937.—(Abstract by GAS).**

THE advent of the more modern type of engine in the natural gas power field is of greatest importance. The field of application is virtually unlimited. Compact in construction, these engines lend themselves readily to installations where space is limited. The engines are fully enclosed, with full pressure lubrication. They may be kept neat and clean. The engines may be safeguarded against ordinary operating hazards, such as low lubricating oil pressure, or dangerously high cooling water temperatures. With such protection, the necessity for continuous attendance is eliminated. Installations may be made on suspended flooring, and insulated against vibration. Exhaust may be muffled to an extent where it will not be noticeable. Starting devices, such as air, electric and individual gasoline engine starters have been developed which, with the newly perfected high tension magnetos and natural gas carburetors, make starting of the engines easy and simple. Some installations have recently been made where the engines are started and stopped automatically. This is done by means of switches actuated by variation in water level in tanks, or water pressure in mains.

During the past three years many thousands of horsepower of these so-called "more modern" engines have been installed for developing industrial and agricultural power. In Southern California a large number of industrial factories, including large refrigeration and cold storage plants, have been converted to natural gas power. Due to limited quarters in the buildings, and close proximity to residences, it had previously been impracticable to attempt to make use of the older type of horizontal engines. Vibration and exhaust noises had to be completely eliminated. Natural gas engine-electric generator units have also been installed in factories, battery plants, creameries, cotton gins, etc., where the need for cheap power was imperative. The citrus and farming communities in Southern California and in San Joaquin Valley have likewise been quick to accept the newly developed natural gas engine as a source of power for irrigation purposes. Using the right angle gear drive in place of the older style quarter-turn belt and idler transmission, installations require much less valuable farm or orchard space. These engines have been giving excellent satisfaction.

The large number of engines which have been installed in the oil fields for oil well pumping in Southern California should not be overlooked. These engines, however, are mostly of the modified "truck" or "tractor" type, of lighter construction and higher speed. The success of these engines in this service may be attributed to the careful attention given by oil company engineers in applying them to loads of approximately one-third the rated capacity of the engines, together with the close inspection and adjustment service rendered either by paid service agencies of the engine distributors or by the service men of the oil companies themselves. The load factor in oil well pumping is sufficiently high that the additional cost of, for example, a 40 horsepower engine to handle a 15 horsepower load, is not economically prohibitive; however, the performance of engines in this type of service cannot be accepted as definite indication of performance to be anticipated when similar engines operating at higher speeds and under heavier loads are being used.

Recent Progress

There has been quite a number of smaller, higher speed engines installed during the past 12 months, driving electric generators, furnishing power and light for large markets, office buildings, cafes, theatres, service stations, etc. These engines are largely adaptations of high speed automobile, or light industrial, engines. Most of these installations include adequate stand-by equipment, at least for the engines, to facilitate service and re-

pair to the engines without serious inconvenience to the consumer. On the other hand, the required amount of service for engines of this type, under loads of this nature, and operating at speeds which have hitherto been considered excessive, is, as yet, an unknown quantity. Ultimate satisfactory operation of these units over a period of years is yet to be proved; however, there are engines in the smaller horsepower range, yet of strictly heavy-duty construction, which can safely be recommended without hesitancy.

The newly developed heavy-duty multi-cylinder does not automatically become the "cure-all" for natural gas power "ills." The problem of application, with engines of this type, is considerably more involved than with the older, heavier, slower speed engines. The latter were rated at their ultimate capacities, and might be operated at, or near, these capacities. The danger of misapplication of engines of this type was not so apparent. The construction of the multi-cylinder engine, having lighter weight of reciprocating parts and more intimate contact between heated surfaces and cooling medium, making for more rapid dissipation of heat, makes possible the operation of these engines at speeds and under loads far in excess of the limits, proved through experience, of safe practice for continuous heavy-duty operation with trouble-free service. These characteristics present a very distinct danger. It becomes increasingly important that the engines be applied in a manner to anticipate future load and speed requirements over the period of useful life of the engines. If possible, the engines should be so installed that these safe limits cannot be exceeded.

The gas utilities, for protection of their own future interests and continuity of load, would do well to closely supervise and direct each individual natural gas power application. Ranking with "correct design and construction," "proper application" is the determining factor for ultimate satisfaction of the modern natural gas engine installation.

A. G. A. Publicity Drive Enters Second Year

WITH the new slogan, "Gas Is Your Quick, Clean, Economical Servant," the American Gas Association's Committee to Conduct National Advertising has started upon the second year of its three-year advertising and publicity campaign with a greatly expanded program — but without an increase in appropriation. The program for the year is announced in a brochure just issued by the A.G.A. Committee. T. J. Strickler, vice-president and general manager, Kansas City Gas Co., is chairman.

T. J. STRICKLER

As the second year starts, 717 companies are participating, 23 more than last year. These 717 companies have in operation 70.33 per cent of all the gas meters in service in the United States. McCann-Erickson, Inc., of New York is the advertising agency in charge of the domestic gas phase of the program and Ketchum, MacLeod & Grove, Inc., Pittsburgh, will handle the industrial gas end.

The budget of about $458,000 has been allocated as follows: $30,000 for industrial and commercial gas advertising; $400,000 for the domestic gas campaign ($20,000 of this will be used for publicity articles and pictures). The balance is reserved for promotional and incidental expenses, and for possible increase in magazine space rates.

Magazines that are to carry campaign advertising will give an increased circulation of 4,671,000 copies over last year. Color messages will be increased by 21,777,000. The additional circulation and color coverage, achieved without any increase over last year's allocation, has been made possible by using two-color instead of four-color advertisements.

In the women's magazines, the advertisements will, as last year, be built around gas for cooking, but this year they will give greater attention to the new features of gas ranges that make for ease of cooking and certainty of good results.

Four of the eight *Saturday Evening Post* advertisements will be the women's advertisements. The remaining four will feature the "4 Big Jobs" that gas does in the home—cooking, refrigeration, water heating, and house heating.

A combination of the advertisements in women's magazines and the "4 Big Jobs" displays in the *Saturday Evening Post* will be used in *American Home, Better Homes & Gardens, House Beautiful* and other magazines dealing with home equipment and home management.

Every advertisement will carry this year's slogan and a reproduction of the Laboratory Approval Seal.

"The World's Easiest-To-Keep House," is the title of the booklet to be distributed during the second year's campaign. Mrs. Constance Holland, home economics writer, is the author. Written in non-technical language, the booklet is a guide to the purchase of gas appliances.

Following is the list of magazines on this year's schedule:

Saturday Evening Post, Life, Good Housekeeping, Woman's Home Companion, McCalls, Pictorial Review, American Home, Better Homes & Gardens, House & Garden, House Beautiful, Architectural Forum, American Builder & Building Age, Domestic Engineering, Plumbing & Heating Trade Journal, Gas Appliance Merchandising, Journal of Home Economics, Practical Home Economics, What's New in Home Economics, Iron Age, Steel, Metal Progress, Metals & Alloys, Industrial Heating, Heat Treating & Forging, Bakers' Helper, Bakers' Weekly, Food Industries, Ceramic Industry, American Restaurant, Hotel Management, American Hairdresser, Modern Beauty Shop.

Additional publicity material will be offered from time to time through the year, and will include reprints of advertisements, 4-page promotional letter, color blow-ups of advertisements, blotter bill inserts, newspaper mats, electros, 24-sheet poster and car card, reprints of ads in chromium frame, decalcomia, range price ticket, window display material, posters, photographs of illustrations in the national ads, 40- to 60-second movie trailers, handy hooks for the kitchen, 3-piece direct mail material, 4-page pictorial gravure tabloid of menus and recipes, depth-o-graph display.

The Committee to Conduct National Advertising wishes to make clear that the material prepared for the campaign is available to any gas company, whether or not it is participating financially in the campaign.

A WINDOW DISPLAY TO HELP YOU SELL MORE "AUTOMATIC" HOT WATER

...and create more interest in durable equipment. Utility and public both benefit from non-rust tanks

THIS handsome display is full color, and life size—42″ high. Use it to stimulate the sale of automatic heaters.

Water heaters with tanks of EVERDUR silicon bronze are profit makers. They require far less servicing, and rust-repair never interferes with the steady consumption of gas.

They may be sold or rented with complete assurance that their reliable performance will satisfy customers . . . because an Everdur tank means clean, rust-free hot water indefinitely . . . ends all tank repair and replacement costs due to rust. *An Everdur tank in a water heater provides a sound basis for longer term payment plans.*

Get your display promptly by filling out and mailing this coupon. 37156

CLIP AND MAIL NOW

The American Brass Company
Waterbury, Conn.

Please send us the EVERDUR window display.

Signe'.....

Company.....

City.....

Stat.....

ANACONDA from mine to consumer

Everdur Metal

RUSTLESS AS COPPER
STRONG AS STEEL

THE AMERICAN BRASS COMPANY, General Offices: WATERBURY, CONNECTICUT

Offices and Agencies in Principal Cities • In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ontario

"EVERDUR" is a trade-mark of The American Brass Company, registered in the United States Patent Office.

● **T. C. WALLACE, Southern Counties Gas Co., Los Angeles, Calif.; in a paper, "The Use of Chlorine Gas for Algae Control in Cooling Towers," to be presented before the Technical Section at the annual convention of the Pacific Coast Gas Association, at Seattle, Wash., August 17-19, 1937.—(Abstract by GAS).**

Chlorine Gas to Control Cooling Tower Algae

ALTHOUGH it has been known for some time that chlorine gas under certain circumstances will destroy the organic growth, or algae, common to most cooling towers, the conditions under which it may be used most effectively for this purpose are quite vague. It has been found that chlorine may readily control the growth of algae in one locality and not in another, conditions apparently being the same at both places.

This company became interested in the use of chlorine for this purpose as the result of a paper presented on the subject by Mr. Hugh Multer of the Union Oil Co. of California. We are indebted to him for his cooperation and numerous suggestions. This report simply details our own experience in the use of chlorine to date and should perhaps be considered as a progress report.

Two factors mainly control the use of chlorine gas in cooling tower systems. First, the algae possess the peculiar faculty of being able to immunize themselves against chlorine if the concentration is not strong enough to kill them at once. Second, chlorine is very corrosive towards most metals encountered in compressor plant piping, and this prevents its continued use at high concentrations.

The secret of success in this method of treatment appears to be in injecting suddenly at intervals of once or twice a week, sufficient chlorine to kill the algae; since it becomes dissipated to the atmosphere in a few hours it does not attack the piping.

The means of injecting chlorine gas into a cooling tower system are shown in Fig. 1. It is simply metered through a glass orifice meter, constructed and calibrated in the laboratory, and then introduced into the water line leading to the circulating pump. This pump distributes the treated water uniformly over the top of the tower, thereby reaching and destroying the algae even in the most remote corners.

This particular system that has been treated for the past year is at the Ventura compressor plant. The cooling tower is of the open type and contains about 50,000 gallons of water, circulating at 3000 g.p.m.

According to published data a concentration of 10 parts per million of chlorine in the water is sufficient to kill the algae.

When tests first began an orifice was used which permitted an injection of 2.5 lbs. of chlorine per hour, which made it possible to reach a concentration of from 5 to 10 p.p.m. in from two to five hours, depending upon the weather conditions and wind velocity. The cooling tower was badly infected with algae at the start of the tests, but by repeating these injections twice a week the algae gradually decreased for about a 60 day period. From that time on the algae growth increased and appeared to be unaffected by altering the injection periods from daily to once a week. After several months operation the tower was thoroughly cleaned out and the chlorine injection was started again. In a short time the algae started to grow again and it was believed this was partly due to the fact that it being summer, the number of light hours per day was increasing. At times it was felt that the algae were again under control as a result of altering the injection periods during the week, but after another five months the tower became so clogged it was necessary to shut it down and thoroughly clean it out once more.

After going over the results it was concluded that the chlorine was being injected too slowly and the algae were therefore building up a resistance to it. In addition it was felt that due to the slow rate of injection a large amount of the chlorine was being dissipated to the atmosphere before the 10 P.P.M. was reached. This resulted in an excessive use of chlorine.

In February of this year the size of the injection orifice was changed so that the gas could be introduced at the rate of 12.5 lbs. per hour. At such a rate it is possible to reach the concentration of 10 parts per million in about 25 minutes, using only about 5 lbs. of chlorine, compared to the 10 to 13 lbs. per injection required with the smaller orifice.

Since February, 1937, the gas has been injected at the rate of 12.5 lbs.

(Turn to Page 34)

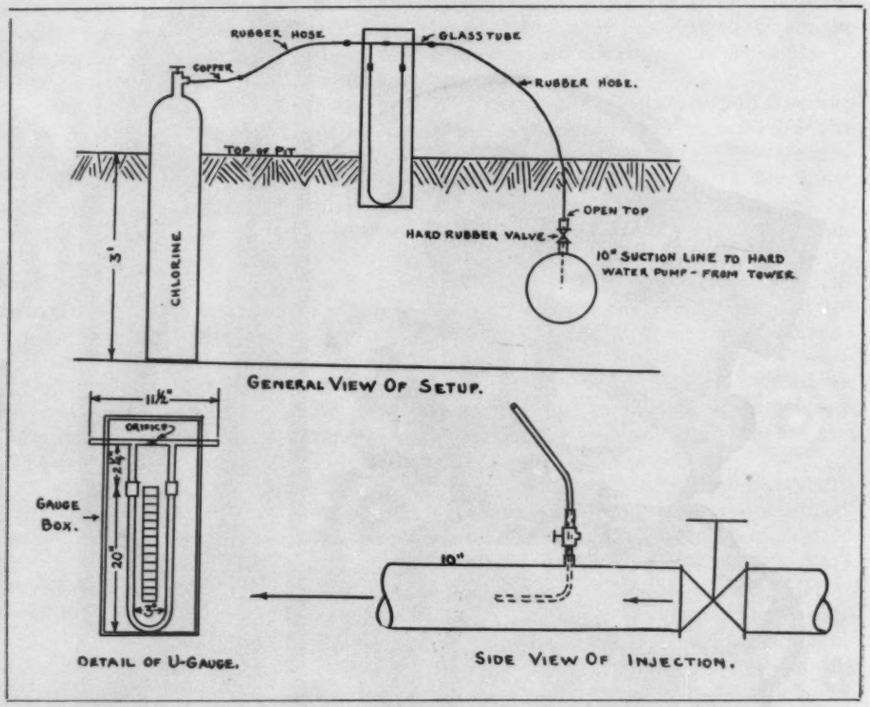


FIG. 1. Diagram of set-up for the injection of chlorine gas into a cooling tower system.

Automatic sectional house heating with efficient, modern appliances of the direct application type with thermostatic control open up a great mass market to house heating by gas. They make such heating practical, inexpensive. They solve the problem of the many homes in which central heating plants cannot be installed. They are rapidly expanding the sales of both fuels and appliances.

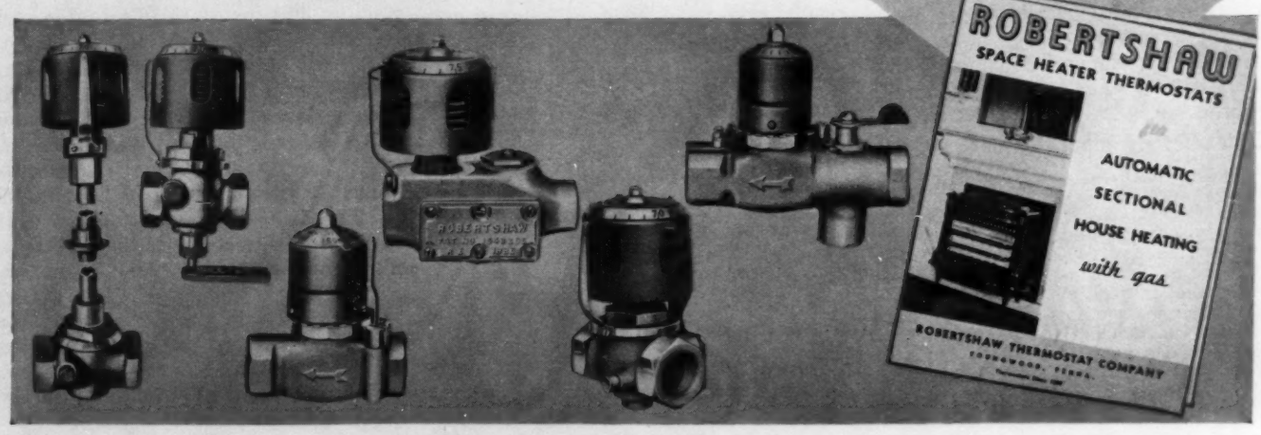
Robertshaw provides a complete line of tested space heater thermostats for circulators, radiant heaters, floor furnaces, unit heaters, warm air units, kitchen heaters and gas steam radiators. Write for Robertshaw Space Heater Thermostat Bulletin.

Write for

ROBERTSHAW SPACE HEATER THERMOSTAT BULLETIN

ROBERTSHAW THERMOSTAT COMPANY

YOUNGWOOD, PA.



per hour but once each week, and the cooling tower has shown no indication of algae growth up to the present time (July, 1937).

The cost of the above described treatment is about $5.00 per month. The upkeep cost of injecting, renewing copper tubing, etc., is about $15.00 per year. Labor cost is not considered, as it is handled by the regular plant foreman.

The use of a periodic concentration of 10 P.P.M. has not been sufficient to cause any corrosion to the pump parts or fittings in the water system. The tests show that all traces of chlorine have left the water system in about one hour after the injections are stopped.

Winter Experiences With High B. t. u. Oil Gas

(Continued from Page 24)

inner part of the holder tank being used for oil storage, the upper surface of the oil is in contact with the raw gas. After leaving the relief holder, the gas passes through the oxide purifiers to the storage holder.

The generator had been preheated with natural gas since November 15, 1936. The heat was maintained by two P.G. and E. type gas burners, one inserted in the secondary blast nozzle and the other in the clean-out door on the bottom of the primary shell. The temperature attained just before the first heat oil period was about 1300° F. at each of the four thermocouples which were located as follows: In the primary and secondary make chamber about six courses down in the checker brick, one in the tunnel between the two shells and the other in the offtake.

The generator was operated on a 14.16 minute cycle with steam used only for oil injection and the 2.2 minute purge. The Diesel oil was not preheated. The temperatures at the four thermocouple points were observed at the end of each heat to aid in maintaining the proper generator conditions.

The heating value of the gas was controlled within close limits and it is noteworthy that the secondary shell was able to handle a large amount of oil; evidently, efficient heating of the secondary as well as the primary shell, occurred.

Summary of generator data:

Date	Dec. 2, 1936
Start of Test	9:20 a.m.
Finish of Test	6:20 p.m.
Time lost, 3 times, leaky stack valve	30 min.
Net Time of Test	8.5 hrs.
Total Number of Runs	36
Net Average Time for Run	14.16 min.
Volume of Heat Oil Used	1,271 gals.
Volume of Primary Make Oil Used	10,400 gals.
Volume of Secondary Make Oil Used	14,400 gals.
Volume of Total Oil Used	26,071 gals.
Average Oil Used per Run, Total	724.19 gals.
Average Oil Used per Run for Heat	35.3 gals.
Average Oil Used per Run, Primary Shell	288.8 gals.
Average Oil Used per Run, Secondary Shell	400.1 gals.
Total Gas Made, cu. ft.	1,962,750 cu. ft.
Total Oil per M	13.28 gals.
Ratio of Heat Oil to Make Oil	0.05125
Mean Heating Value of Gas Made	1,057 B.t.u.
Net Gallons Oil per M Make Oil Only	12.64 gals.

The yield of tar was estimated at 6,000 gals. or 3.06 gals. per M. This is only an approximation. Some of the tar floated away in the effluent water. No lampblack was produced.

Quality of Raw Gas: the heating value of the gas was determined with the Junkers calorimeter during all but five runs. The gas was sampled at the inlet of the relief holder. The average B.t.u. of the gas at this point was 1,057.

The hydrogen sulphide was not determined during the runs, but the next day after standing over oil in the relief holder the average of the five close checks was only 16 grains of H_2S per 100 cu. ft. This very low result may have been occasioned by delay in testing.

Two analyses of the raw gas are:

Date	12-2-36	12-2-36
Time	1 p.m.	2:30 p.m.
CO_2	1.5	1.5
Illuminants	29.1	30.4
O_2	0.4	0.3
CO	2.4	1.9
H_2	20.6	17.5
CH_4	42.9	45.5
N_2	3.1	2.9
	100.0	100.0
Estimated B.t.u.	1116	1190

These analyses were on spot samples not representative of the whole, but the very large per cent of illuminants should be noted.

The last five runs from the generator were stored in contact with Diesel oil in the holder. After standing 20 hours the gas showed a loss of 98 B.t.u. The purified gas standing six days in the holder in contact with water showed a loss of about 64 B.t.u. It is apparent that six days of standing over water does not show as much loss in heating value as a few hours in contact with oil.

Stability of Purified Gas:

Last five runs of raw gas—Average	992 B.t.u.
Same after standing 20 hours over oil—Average	894 B.t.u.
Loss of	98 B.t.u.
All 36 runs of raw gas Dec. 2—Average	1057 B.t.u.
Purified gas after 6 days over water	993 B.t.u.
Same after contacting oil over night	990 B.t.u.
Gross loss in heating value 1057 - 990	67 B.t.u.

Following is the analyses of the purified gas in the storage holder while pumping to the relief holder and also static:

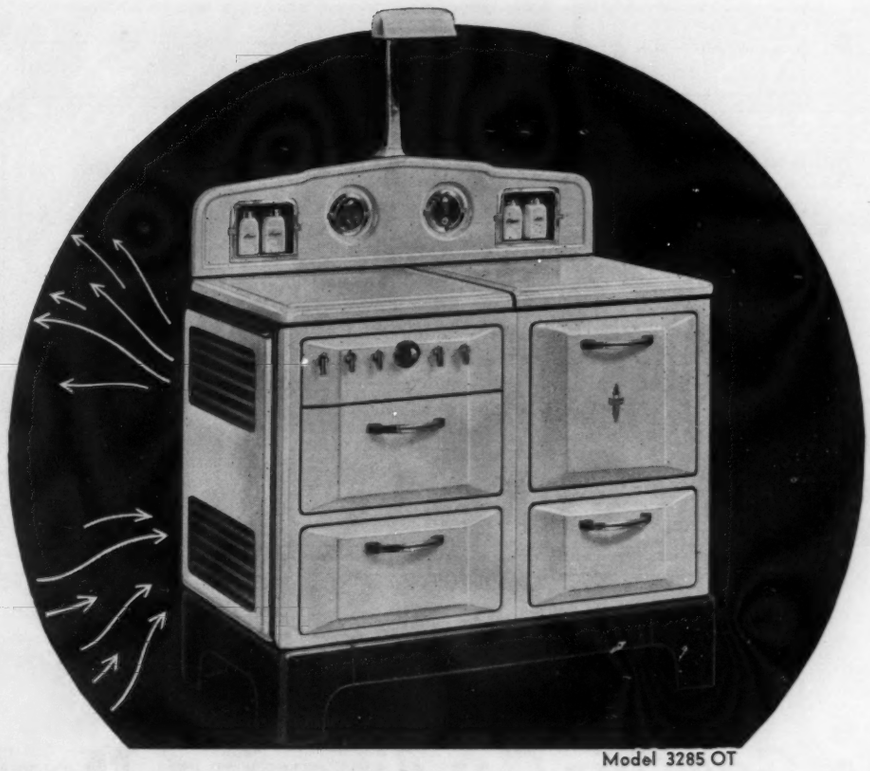
Date	12-7-36	12-15-36
Time	1:37 p.m.	1:15 p.m.
Condition	Pumping to No. 1	Static Gas
CO_2	2.5	2.4
Illuminants	17.0	15.5
O_2	0.5	0.4
CO	2.2	2.1
H_2	18.7	14.9
CH_4	54.3	59.4
N_2	4.8	5.3
	100.0	100.0
B.t.u.	969	974

Dec. 2—Raw gas, mean illuminants	29.8%
Dec. 7—Purified gas, mean illuminants	17.0%
Loss of illuminants in 5 days	12.8%

The total sulphur content of purified gas at inlet of No. 3 holder was 2.74 grains per 100 cu. ft., a very low value.

Conclusions:

Using Diesel oil in the No. 7 Jones 2-shell generator, rated at 5 million cu. ft. per day, 1963 M c.f. of gas were made in 36 runs of 14.16 minutes each on the average, at the rate of 5,542 M c.f. per day with a mean heating value of 1057 B.t.u. per cu. ft. An average of 35.3 gals. of heat oil and 688.8 gals of make oil were used per run. The capacity of the generator appeared to be increasing at the end of the run. Six days later the heating value appeared to be stable at 993 B.t.u. per cu. ft. This gas was an excellent substitute for natural gas and evoked no complaints from 6,000 consumers to whom it was served. No trouble was encountered in its manufacture or distribution.


WARM AIR LEAVES BY FORCED CIRCULATION
COLD FLOOR AIR DRAWN IN AND FILTERED THROUGH HEATER
A WARM KITCHEN ON COLD DAYS
A COOL KITCHEN ON HOT DAYS

Model 3285 OT

COMPACT WEDGEWOOD MASTERPIECE

with New BUILT-IN CIRCULATOR UNIT

This newest Wedgewood is in step with the trend toward small, efficient "step-saving" kitchens! A gas circulator heater is built right in—doesn't add an inch to the length of the range! Architects report that the total necessary kitchen area is reduced as much as 78 cubic feet.

The important thing to the housewife is that this beautiful new WEDGEWOOD MASTERPIECE has every advanced cooking feature PLUS the cheering warmth of a gas circulator heater, regardless of the size of her kitchen!

OTHER IMPORTANT WEDGEWOOD FEATURES

★ EXTRA-LOW TEMPERATURE OVEN
True low temperature cooking. Automatic Lighting.

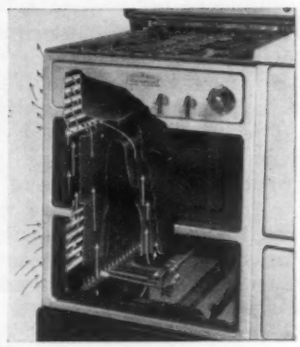
★ ROTOR-DISC ASTOGRIL BROILER
Sears and broils both sides at once.

★ AUTOMATIC CLOCK AND TIMER
Complete automatic control.

★ SPEED-PLUS-SIMMER BURNERS
Light automatically.

★ DOUBLE LIFT-UP COVERS
Double pot-and-pan working area.

★ GLIDING UTILITY DRAWERS
For utensils. Also to warm dishes.



CROSS SECTION OF BUILT-IN GAS CIRCULATOR HEATER

Shows heating unit and automatic Safety Lighter. Heating unit formed from a single piece of steel for better conductivity, more heat. Full Porcelain enameled. Capacity 20,000 BTU. Does not increase range size.

WEDGEWOOD **THE MODERN GAS RANGE**
MAKES FRIENDS FOR GAS

JAMES GRAHAM MANUFACTURING CO. • SAN FRANCISCO, LOS ANGELES, NEWARK, PORTLAND

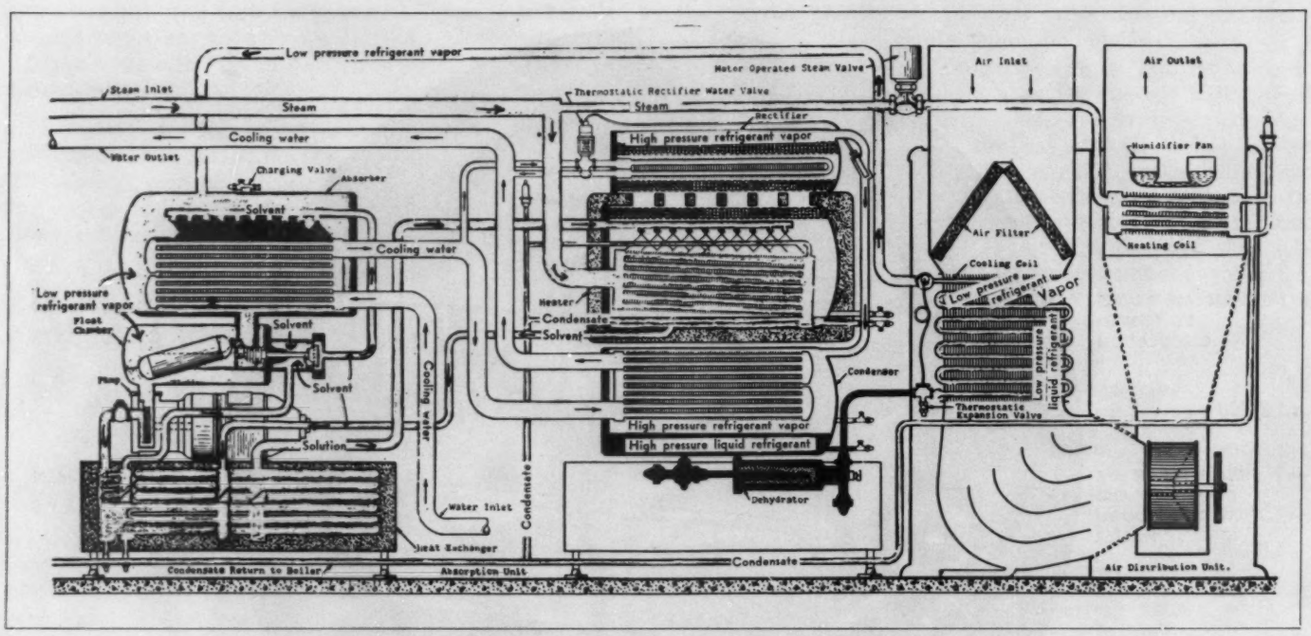


FIG. 5. Operating cycle of absorption refrigeration unit.

The Gas Air-Conditioning Market

(Continued from Page 17)

ed so long as ammonia was used as a refrigerant due to the high pressure, low thermal efficiency, large size of the equipment per unit of refrigeration and irritant, toxic, and corrosive characteristics of ammonia.

A new type of absorption refrigeration equipment has recently been placed on the market which largely overcomes these objections. It is an outgrowth of the development of the new refrigerants which are now being used in the compression refrigeration systems of domestic refrigerators and air-conditioning equipment. This new refrigerant, known by the trade name of "Zeon," is dichloromonofluoromethane ($CHC1_2F$) and is manufactured by Kinetic Chemicals Incorporated. It is one of the Freon series and classified by them as Freon No. 21 or F21. The solvent is known by the trade name of "Zeo-Solve" and is dimethylether of tetraethylene glycol ($CH_3 (OCH_2CH_2)_4 OCH_3$), manufactured by Carbide and Chemicals Corp. These newly developed chemicals fulfill the requirements of comfort cooling with ideal operating conditions and with a high efficiency and a corresponding low operating cost. They are essentially non-toxic and non-irritant, non-inflammable, chemically inert, non-corrosive, and chemically stable, and have a low specific heat with a high coefficient of heat conductivity.

The equipment assembly is composed of five essential parts: (See Fig. 5) (1) a condenser consisting of a shell which serves as a reservoir for high-side vapor, the liquid refrigerant, and the cooling coil for condensing this vapor, the entire assembly being conventional in principle and design; (2) the absorber consisting of a shell, cooling coil, and a set of nozzles, the purpose of this assembly being to absorb the refrigerant vapor from the cooling coil; (3) the solution pump mounted over the absorber which pumps the solution, the combination of the solvent and refrigerant, through the heat exchanger into the heater; (4) the heater which consists of a shell, a steam-heating coil, set of spray nozzles, and a rectifier mounted directly above the shell, the rectifier preventing solvent vapors from being carried into the condenser and down into the low side of the system, the heater assembly service to separate the solvent from the refrigerant; (5) the heat exchanger which consists of a series of double-pass coils effecting transfer in heating between the solvent in returning from the heater to the absorber and the solution in going from the absorber to the heater.

Along with the absorption unit, there is, of course, required a steam boiler to furnish steam to the heating coils in the absorber and a cooling coil with expansion valve located in the air stream which is being delivered to the air-conditioned space. This equipment is built in two different models, one for use where cooling water is cheap and abundant and an adequate arrangement can be made for disposing of the cooling water, and second, a more recent development which has placed the condenser and the absorber in a separate unit whereby the effect of evaporative cooling is used rather than pumping condenser water through the units.

For the proper function of an absorption unit, the characteristics of the solvent and refrigerant must be such that the solvent has ability to absorb a large amount of refrigerant vapor at relatively low temperature and pressure and to give up this vapor freely at a relatively high tempera-

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● "I'm sorry about the finish on your friend's appliance. It's too bad to pay a lot of money for something one thinks is so pretty—only to have it fade and become dull and be something one is ashamed of.

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Speaking of Control!

A precision combustion control must:—

1. Accurately proportion gas and air mixture.
2. Maintain accurate proportion over operating load range.
3. Hold CO within .2 of 1% plus or minus.
4. Compensate for barometric and wind variations.
5. Compensate for gas variations.
6. Compensate for draft differences across the furnace front.
7. Maintain steam pressure within 1½# plus or minus.
8. Automatically compensate for cutting burners off or on.
9. Operate over full range on .01" W.C. draft change.

The WECO Precision Combustion Control will do all of the above continually and costs very little more than a less accurate type of control.

TYPES

The outstanding control is the Series No. 1 WECO Precision Combustion Control — holds exact, any predetermined steam pressure. Maintains constant combustion quality under all variable conditions.

Pilot operated boiler fuel governor with gradual opening seats and damper control mechanism.

Direct operated boiler fuel governor.

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Tulsa, Oklahoma

Division of

SURFACE COMBUSTION CORPORATION TOLEDO, OHIO

Pacific Coast Distributors

NATURAL GAS EQUIPMENT, INC.—LOS ANGELES—SAN FRANCISCO

F. J. Evans Engineering Co. - Birmingham Gas & Heating Specialty Co. - Dallas Mechanical Equipment Co. - Houston

ture and pressure. The refrigerant and solvent used have these properties and, therefore, the size of the equipment used is very much smaller than that necessary when ammonia is the refrigerant. This particular equipment is built in a range of four sizes from four tons of refrigeration to 26 tons of refrigeration in capacity. The units are designed to operate on a steam pressure as low as 10 lbs. or even on hot water. Of course, the capacity will vary according to the steam pressure used although the thermal efficiency of the equipment remains practically constant. The heat input required is 20,000 B.t.u.'s per hour per ton of refrigeration. This is equivalent to .28 therms of gas or 24 cu. ft. of gas of 1150 B.t.u. per cu. ft. per ton hour of refrigeration.

The installation of a steam-heating coil and humidifier in the air-handling unit is simple and comparatively inexpensive, and its addition provides both summer and winter air conditioning from the same equipment. The controls for this system are simple and automatic. They consist of a master control and two thermostats; one for winter temperature control and another for summer temperature. The switch may be set for either heating or cooling in which case the winter or summer thermostat takes command. When the switch is in the vertical position only the fans operate to provide ventilation.

About 35 of these installations are now in operation in residences, commercial and utility companies' buildings in the central and southwest sections of the United States, the first ones being installed in 1934. So far as can be determined they have been almost entirely satisfactory and economical to operate.

Use of Silica Gel

The principle of adsorption of moisture by means of silica gel is too well known to gas men to need any extended description. Silica gel, an extremely porous material, presents a large surface contact to the air and has such an enormous affinity for moisture as to adsorb a high percentage of water vapor coming into contact with it.

Normal commercial silica gel will adsorb approximately 40 per cent of its weight of water from saturated air. When it becomes saturated and can adsorb no more water it is then reactivated by the simple process of applying heat which dries the silica gel by evaporation of the water it has adsorbed from the air. This drying process is performed by applying a gas flame to the bed being dried and thus produces gas consumption from this type of equipment.

From this it can be seen that the only function of this piece of equipment is that of dehumidifying air. In some sections of the United States where high humidities are one of the problems met in summer air conditioning, this equipment is most suitable for installation as a part of an air-conditioning system.

On the Pacific Coast, however, usual summer humidities are so low that little or no dehumidification is necessary and, therefore, this equipment is not particularly adapted to our use. It does, however, have a place in the air-conditioning picture, not particularly for comfort cooling work, but in industrial work where the maintenance of low humidities are necessary in connection with the manufacturing process.

The Ice Engine

The so-called ice engine consists of a gas engine driving a refrigeration compressor. This equipment can be used to advantage wherever refrigeration is required.

The original development of this equipment by the Waukesha Engine Co. was for use in summer cooling of railway passenger cars and Pullman cars. The engine itself is not a gasoline engine converted to the use of natural or manufactured gas but is an engine designed particularly for use with manufactured gas, natural gas, butane, or propane and other bottled gases as fuel.

This equipment was later adapted to stationary use, is furnished complete on a base and covered with a sound-proof cabinet, and is completely automatic in operation. A range of sizes from seven to 30 tons refrigeration capacity are available.

An engine-driven refrigerating compressor has one decided advantage over an electric-motor operated compressor because it can be operated at variable speed corresponding to the refrigeration demands of the system. This gives extreme flexibility of operation and economies which are not found with motor-driven compressors.

The ice engine is being used quite extensively for air-conditioning work throughout the southwest territory and installations have been in operation for a sufficient period of time to indicate the actual gas consumptions which will result. Tests under usual operating conditions indicate a gas consumption very close to 14,000 B.t.u. per hour per ton of refrigeration produced.

These four methods of summer cooling are practical tools with which we may build summer-gas load.

Let us now see what happens to our winter-heating load when gas-consuming devices are installed for summer air-conditioning work. Fig. 3 shows the monthly send-out of gas for the same building illustrated by Figs. 1 and 2 when summer air-conditioning equipment is installed, either the steam jet vacuum cooling or the absorption refrigeration process.

Explanation of Curve

Little explanation of this curve is necessary. You will observe that the minimum monthly send-outs occur in the months of May and November. This is because of the mild spring and fall weather which prevails at this time. Neither heating nor cooling is necessary to any great extent.

The high gas consumption indicated during the four summer months is not indicative of a high hourly demand by the equipment. In the case of the few installations which have been analyzed, the data indicate that the present steam boiler which is now being used for winter heating is adequate to furnish steam to the summer air-conditioning equipment. The high monthly consumption is the result of a constant load upon this plant during every day of the month.

You must appreciate that the characteristics of a summer air-conditioning load are different from those of a winter-heating load. The winter-heating demand is heaviest in the early morning hours. A cooling load is at a minimum at this particular time of day and increases gradually throughout the day. This demand places a constant load on the steam boiler throughout the entire working day and in some instances it may be necessary to operate the cooling plant during the night in order to maintain the cool building temperatures which have been secured. The cooling load, therefore, has a better daily load factor than the winter-heating load.

It should also be observed that the addition of summer air conditioning almost exactly doubles the yearly gas consumption.

The next logical question rising in our minds regarding summer air conditioning is "What are we going to do about it?" There certainly is one thing which we can do immediately and that is to install these types of summer air-conditioning plants in our own offices and places of business. By doing this we can prove to our

buying public that gas air conditioning is practical, economical and the logical method by which they should cool their buildings.

Acting upon this thought, the Pacific Gas and Electric Co. is installing a steam jet vacuum cooling system and an absorption refrigeration plant for cooling two of its office buildings in the Sacramento and San Joaquin Valleys respectively. These plants will be used as demonstration installations in the promotion of this valuable summer gas load. They will be equipped with meters, gages and thermometers to show the gas consumptions and the conditions maintained in the buildings.

The cost of installing these plants indicates that the equipment is competitive with electric refrigeration for air-conditioning work. The cost of electric compression refrigeration equipment for one of these buildings amounted to $303 per ton of installed capacity. Steam jet vacuum cooling equipment was installed at a price of $308 per ton of installed capacity. The absorption refrigeration plant costs were approximately $348 per ton of installed capacity exclusive of the steam boiler. This latter cost will undoubtedly decrease when factory production increases.

Comparisons of operating costs between electric compression equipment and these four types of gas air conditioning have been made which indicate that the operating costs are as low as, if not lower than, the cost of the electric-driven plants.

If we assume that the gas installations are operated with 1,000 B.t.u. natural gas at a rate of 50c per M c.f., we find that the steam jet vacuum cooler and the absorption refrigeration equipment will compete with electric-driven equipment consuming electricity at a rate of 1.4c per kilowatt-hour.

The silica gel equipment for dehumidification purposes, where this is necessary, will compete with electric refrigeration for dehumidification with an electric cost of 1.2c per kw.-hr.

The ice engines are still more economical in operation and will compete with electricity at .7c per kw.-hr.

From these comparisons it may easily be seen that the gas-operated equipment has nothing to fear from the electric-operated equipment in so far as installation or operating costs are concerned.

It is impossible to vision a limit to the potential air-conditioning load. The American people are adopting air conditioning as an essential part of their lives just as they have adopted the automobile or the radio. The desire for air conditioning is everywhere.

Installations are being made not only in the warm climates but in mild or cool regions such as San Francisco or Los Angeles. Newspaper plants, restaurants, hotels, cocktail lounges, banks, theatres, and dancing places have found that air conditioning is not only necessary but actually pays for itself in increased patronage and reduced labor costs.

The Electrical Fraternity reports this load as a possible hundred million dollar additional revenue by 1945. Already the electrical utilities on the Pacific Coast are enjoying a revenue of at least $400,000 per year. These installations are so thinly spread out over the Pacific Coast territory that no one has yet ventured to discuss saturation.

The future is limited only by the extent of our own efforts. The next step in the development of this gas load is carefully planned, aggressive sales promotion.

Southern Natural Buys Alabama Companies, Adds Compressors

SOUTHERN Natural Gas Co., Birmingham, Ala., in a program of expansion, has purchased the Alabama Gas Co. and Huntsville Gas Co., is beginning construction of a new compressing station at Birmingham, and is enlarging three existing stations.

According to William R. Gignilliat, vice-president and secretary, Southern Natural took over active management on May 27 of the properties it purchased from Consolidated Electric & Gas Co. Alabama Gas Co. owns and operates natural gas distribution systems in Montgomery, Selma, Anniston, Gadsden, and Tuscaloosa, Ala., and a manufactured gas distribution system in Decatur. Huntsville Gas Co. owns and operates a manufactured gas distribution system in Huntsville.

The official and operating personnel of Alabama Gas Co. and Huntsville Gas Co. is as follows:

C. T. Chenery, chairman of the board; C. P. Rather, president; H. Gordon Calder, vice-president and treasurer; William R. Gignilliat, vice-president and secretary; J. W. Gates, vice-president and general manager; H. E. Jackson, comptroller; R. H. Burdick, chief engineer; A. Bush, assistant engineer; A. Bennett, manager at Montgomery; R. A. Puryear, Jr., manager at Selma; J. H. Smith, Jr., manager at Anniston; C. H. Horne, manager at Gadsden; H. R. Derrick, manager at Tuscaloosa; S. W. Brown, manager at Decatur; and H. G. Crunk, manager at Huntsville.

Personnel of Southern Natural Gas Co. is now as follows:

C. T. Chenery, chairman of the board; C. P. Rather, president; H. Gordon Calder, vice-president and treasurer; William R. Gignilliat, vice-president and secretary; H. D. McHenry, vice-president and assistant secretary; H. E. Jackson, comptroller and assistant treasurer; Theodore Pearson, assistant secretary; John M. Starke, Jr., assistant secretary; Frederic T. Tansill, assistant secretary and assistant treasurer; R. H. Burdick, chief engineer, R. H. Ulrich, general superintendent; J. B. Milmoe, new business manager; J. D. Kennedy, purchasing agent.

With construction of the new compressing station at Birmingham, the station at DeArmanville, Ala., will be dismantled and the two engines there moved to the new station. An additional engine will be installed also.

Two engines will be added to the company's station at Perryville, La.; one engine will be added to the station at Onward, Miss., and two additional engines will be installed at the compressing station at Louisville, Miss.

Southern Natural Gas Co. also owns and operates Alabama Natural Gas Corp., which, in turn, owns natural gas distribution systems in the Alabama communities of Auburn, Heflin, Leeds, Opelika, Reform, Talladega, Tuskegee, Wetumpka.

■ ■

April Revenues Rise 15.4% Over Last Year

A gain of 15.4 per cent in revenue was reported by natural gas companies for April, 1937, over April, 1936, according to statistics released by the American Gas Association. Natural gas sales increased 19.2 per cent over April of last year. Sales for domestic purposes and for industrial use each were 18.9 per cent ahead of last April.

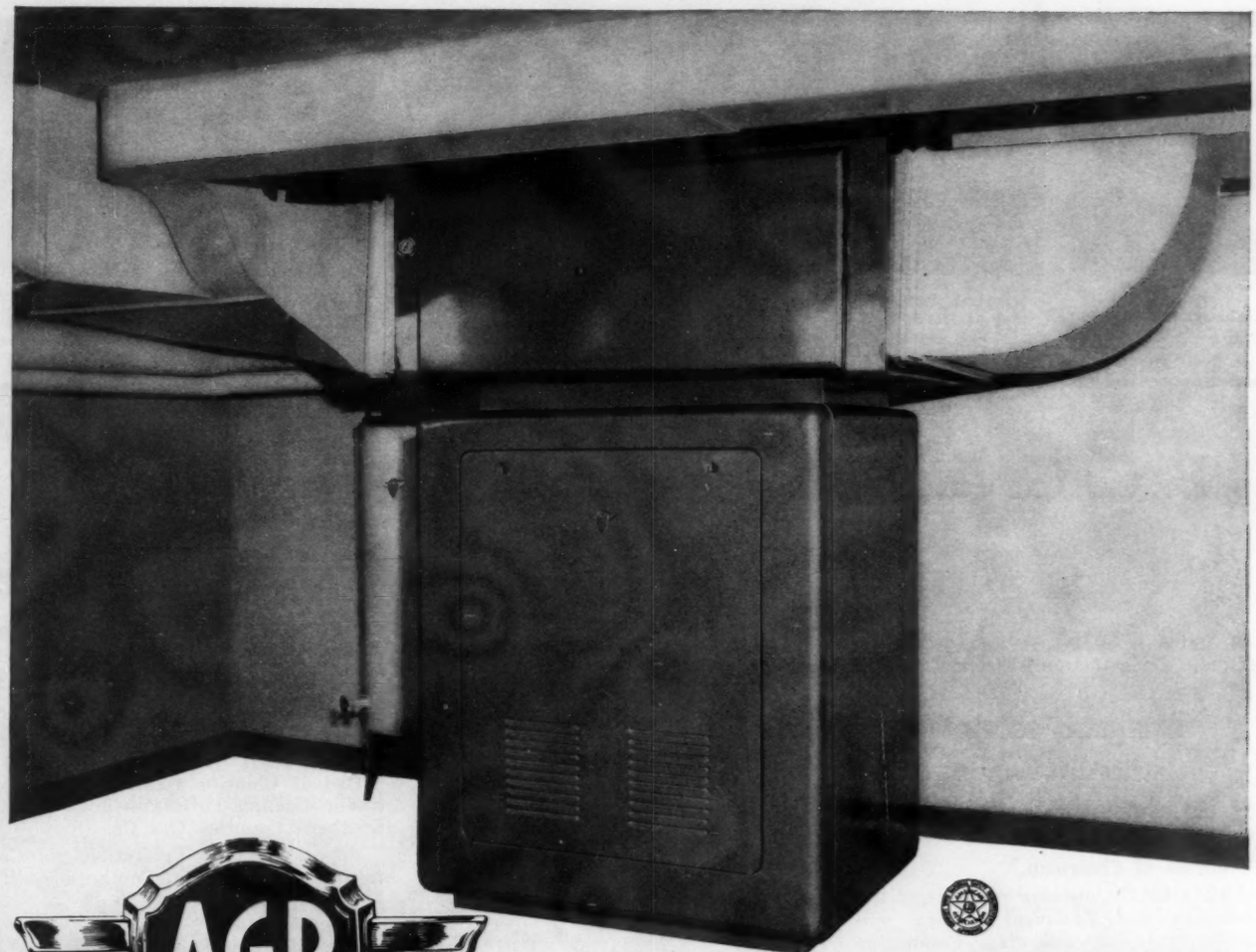
Natural gas statistics for April, 1937, are as follows:

Revenues	$42,670,700
Sales, cu. ft.	125,831,800,000
Domestic Sales (including house heating), cu. ft.	39,563,200
Commercial and Industrial Sales	84,902,700

■ ■

N. M. Gas Co. To Survey Belen

New Mexico Gas Co. has notified the city council of Belen, N. M., according to a press dispatch, that it will investigate the possibilities of gas service for Belen.



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AIR CONDITIONER
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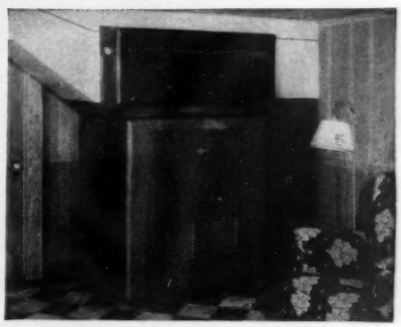
(Above) *A complete* **AGP** *Gas-Fired Air Conditioning and* **AGP** *Hot Water installation in a Detroit home. Note how compact it is . . . leaves almost entire basement free for recreation purposes.*

(Right) *A Buffalo, N. Y., homeowner takes full advantage of his* **AGP** *Air Conditioner — turns his basement into a beautiful, useful room with the smart gun-metal gray jacket of the* **AGP** *unit a truly pleasing note.*



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Boils Air Conditioning down to a few simple facts

NO ordinary conditioner is this entirely new **AGP** unit! In design and mechanical features it surpasses *any* GAS-FIRED conditioner on the market. It makes really low-cost, completely automatic air conditioning a reality. It warms, filters, humidifies and circulates air with amazing efficiency, yet simplicity is its keynote.

Two fan motor sizes for each heating capacity provide correct conditioning for insulated or uninsulated homes. Six sizes, 12 models, condition homes from 9,900 to 39,600 cu. ft. Everyone will like this new **AGP** Type 2-FE Conditioner — architects, builders and homeowners. Write for full details today.

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1. **NO OTHER AIR CONDITIONER** is as completely assembled when delivered to job.
2. **REQUIRES LESS FLOOR SPACE** because fan motor compartment is mounted on top.
3. **SINGLE COMBUSTION CHAMBER** in every size conditioner. Requires only a minimum pilot light Gas consumption.
4. **HIGHEST OPERATING EFFICIENCY** due to counter flow principle. Gets more heat from smaller surface.
5. **EASY AND ECONOMICAL TO INSTALL.** Whole conditioner is compact. Few parts to assemble. Even cored cast iron heating sections are factory assembled.

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DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION
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MRS. J. F. POLLARD
One of the Convention's Hostesses

N. R. McKEE
1937-38 Presidential Nominee

A. C. JOY
Chairman, Cooperative Advertising

P. C. G. A. 44th Convention Program Set

(Continued from Page 19)

and Value in Sales Promotion—C. C. McRae, Pacific Gas and Electric Co.

TECHNICAL SECTION

AUGUST 17—2:00 P.M.

Otto Goldkamp, General Chairman
San Diego Consolidated Gas and Electric Co.

Address of Chairman.

Following the opening remarks of the Chairman the Technical Section will divide into the following Committee meetings:

DISTRIBUTION COMMITTEE ROUNDTABLE

AUGUST 17—2:15 P.M.

W. F. Pape, Chairman
Pacific Gas and Electric Company

Joint Meeting with Large Volume Measurement Sub-Committee of the Transmission Committee.

Do We Buy Gas Meters on Price*—H. S. Harris, Southern California Gas Co., Chairman, Measurement and Regulation Sub-Committee.

Proposed Method for Reporting Meter Statistics*—H. S. Harris, Southern California Gas Co.

Pilot Testing vs. Four-Pointing†—H. A. Faull, Southern Counties Gas Co.

Advantages of Temperature and Humidity Control in the Prover Room—C. W. Capwell, San Diego Consolidated Gas and Electric Co.

Operating Expectancy of Large Volume Displacement Meters—B. C. Williams, Southern California Gas Co., Chairman, Large Volume Measurement Sub-Committee.

Factors Affecting the Use of Integrating Meters—E. H. Fisher, Coast Industrial Gas Co.

PRODUCTION COMMITTEE ROUNDTABLE

AUGUST 17—2:15 P.M.

John Keillor, Chairman
British Columbia Electric Railway Co., Ltd.

Seattle's New Oil Gas Plant—Geo. R. Horning, Seattle Gas Co.

Yield of Tar in the Manufacture of High B.t.u. Oil Gas—C. Eldon White, San Diego Consolidated Gas and Electric Co.

Past Winter Experiences and New Experiments in the Production of High B.t.u. Oil Gas†—C. W. Beck, Southern California Gas Co.; M. J. Cereghino, Southern California Gas Co.; R. A. Chambers, San Diego Consolidated Gas and Electric Co.; J. E. Kelley, Pacific Gas and Electric Co.

Production of Coal Gas, Blue Gas and Carburetted Water Gas Simultaneously in One Plant—John Keillor, British Columbia Electric Railway Co., Ltd., Vancouver, B. C.

TRANSMISSION COMMITTEE ROUNDTABLE

AUGUST 17—2:15 P.M.

A. B. Allyne, Chairman
Southern Counties Gas Company

Report of Pipe lines Sub-Committee—F. E. Wilson, Pacific Gas and Electric Co., Chairman.

Dehydration on the Montana Power Company's Transmission Lines—R. D. Smith, Montana Power Co.

Report of Compressor Plant Sub-Committee—H. J. Smith, Pacific Gas and Electric Co., Chairman.

Operation and Maintenance of Gas Engines—Leal Davis, Pacific Gas and Electric Co.

Use of Chlorine Gas for Algae Control in Cooling Towers*—T. C. Wallace, Southern Counties Gas Co.

Report of Pipe Protection Sub-Committee—H. G. Laub, Southern California Gas Co., Chairman.

Discussion of:
The Effect of Soils on Asphalts.
A New Soil Conductance Meter.
A Typical Electrolysis Survey.

GROUP BREAKFASTS

AUGUST 18—8:00 A.M.

Accounting Section.
Home Service and Sales.
Technical Section.

GENERAL SESSION

AUGUST 18—10:00 A.M.

Olympic Bowl

Facts About Dealer Sales—Their Utilization and Value—F. U. Naylor, Manager gas sales, Pacific Gas and Electric Co.

Our Hidden Talent—Doris Allen, Advertising department, Southern California Gas Co.; Chairman, Women's Committee, Pacific Coast Gas Association.

The Competitive Situation in the Pacific Northwest—Franklin Griffith, Chairman of the Board, Seattle Gas Co.

Co-operation in Sales Promotion—Paul B. McKee, President, Portland Gas and Coke Co. *(Turn to Page 45)*

* A digest of this paper is published in this issue.
† Published in full in this issue.

† Published in full in this issue.

* A digest of this paper is published in this issue.

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For a score of years, the BARBER MARK on any Gas Burner has been an emblem of dependability. It has been more than that—a pedigree of the *fitness* of that burner for its specific use. Every burner unit was *individually engineered* for its job. Every burner has the unique Barber combustion principle. That combination has never been equalled.

Leadership implies obligation. Barber business was never built on merely selling burners. It *was* built on developing and selling burners which are *correct* for their particular purposes. We can and will assist any reputable gas appliance manufacturer on that kind of problem.

It is a definite and permanent part of Barber policy to "lend a hand". Appliance makers, heating trade, and gas companies know that. We welcome the opportunity to work with you on any gas burner problem.

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BARBER *Automatic* JET GAS BURNERS

Flick-of-a-Finger Heating

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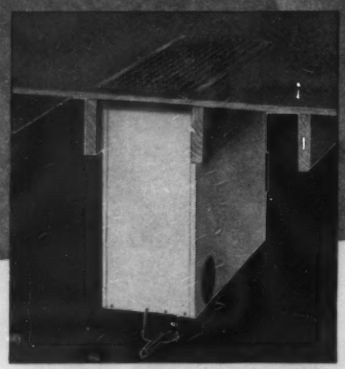
AMERICA wants low-cost automatic heating — *and gets it* in the Estate Gas Heatrola. The twirl of a dial in the room thermostat sets the temperature — and holds it. Flick-of-a-finger heating is a tremendous talking point with Heatrola's new and improved remote control.

Here is the gas heating line that's easy to merchandise and sell. Tried. Proved. Backed by one of the most famous names in heating. Send for Catalogue No. 115. The Estate Stove Company, Hamilton, Ohio.



ESTATE IN-A-FLOOR HEATROLA Nos. 75-F, 45-F, 20-F

Installed in the floor, between joists. Saves wall and floor space. Only the register face is visible and the control is all from above. Combustion chamber completely closed and flue connected. Three sizes.

ESTATE GAS HEATROLA Nos. 247-147-97

A striking new line of Heatrolas, encased in dark walnut ripple-finish cabinets, set off with chromium beading. Interior construction consists of specially designed radiating units of welded steel. Air tight. Gas tight. With lateral burner of unique design. Economical in operation. Two types of heat control available. Three sizes.

ESTATE GAS HEATROLA Nos. 171-161

A compact Heatrola with remarkable circulating power. Usually installed in front of fireplace. Gives cozy, cheerful glow through mica door. Ideal for efficient heating of one or two rooms. Two sizes.

B. W. REYNOLDS
Sales, Advertising Section Chairman

OTTO GOLDKAMP
Technical Section Chairman

J. Q. EWING
Accounting Section Chairman

W. J. BAILEY
Manufacturers' Section Chairman

DORIS ALLEN
Chairman, Women's Committee

C. R. GRAHAM
Nominated Chairman, Manufacturers' Section

PARALLEL SESSIONS

ACCOUNTING SECTION

AUGUST 18—2:00 P.M.

J. Q. Ewing, Chairman
Southern California Gas Company

Discussion of Timely Problems in Customers' Bookkeeping.

Experiments in Waiving Meter Deposits.

Bookkeeping for Customers' Installment Accounts.

Customers Machine Bookkeeping.

SALES and ADVERTISING SECTION

DOMESTIC SALES ROUNDTABLE

AUGUST 18—2:00 P.M.

N. O. Fratt, Chairman
Seattle Gas Company

Revenue from Empty Fireplaces — J. S. C. Ross, Pacific Gas and Electric Co.

Selling Electrolux in Competition with Low Priced Electric Refrigerators — J. E. Kern, Southern California Gas Co.

Demonstrations for Church and P.T.A. Groups—I. C. McGee, Seattle Gas Co.

HOME SERVICE ROUNDTABLE

AUGUST 18—2:00 P.M.

Gladys Price, Chairman
Southern California Gas Company

Home Service Steps into Sales and Service Departments—Mildred Seaburg, Southern Counties Gas Co.

Contacting New People—Ruth Kruger, Central Arizona Light and Power Co.

The Ideal Demonstration for Dealers —Patricia Barkelew, So. Counties Gas Co.

COMMERCIAL AND INDUSTRIAL SALES ROUNDTABLE

AUGUST 18—2:00 P.M.

R. T. Stephens, Chairman
Pacific Gas and Electric Company

The Potential Gas Engine Business*—Manley H. Clark,, So. Counties Gas Co.

The Application of Unit Heaters to Commercial Heating—R. W. Trowbridge, Seattle Gas Co.

TECHNICAL SECTION

DISTRIBUTION COMMITTEE ROUNDTABLE

AUGUST 18—2:00 P.M.

W. F. Pape, Chairman
Pacific Gas and Electric Company

Report of Unaccounted-for Gas Sub-Committee — F. A. Hough, Southern Counties Gas Co., Chairman.

Pressure Control Fittings—H. F. Carr, Pacific Gas and Electric Co.

General Discussion of the Cause and Mitigation of Gas Main Dust.

UTILIZATION COMMITTEE ROUNDTABLE

AUGUST 18—2:00 P.M.

Guy Corfield, Chairman
Southern California Gas Company

Effect of Fluctuating Service Pressure —C. Eldon White and Chas. W. Stewart, San Diego Consolidated Gas and Electric Co.

Report of Sub-Committee on Employee Training—J. E. C. Currens, Pacific Gas and Electric Co., Chairman.

The Preparation of Study Material for Gas Service Training — Scott A. Salisbury, Pacific Gas and Electric Co.

Service Training Methods in Portland Gas and Coke Company—C. R. Miller, Portland Gas and Coke Co.

Report of Gas Lighting Sub-Committee—C. A. Thorp, Southern California Gas Co., Chairman.

AUGUST 18—5:15 P.M.

Moonlight Aquatic Outing on Puget Sound, Lake Union and Lake Washington.

Picnic Supper, Dancing and Entertainment.

Buses will leave the Seneca Street Entrance of the Olympic Hotel promptly at 5:15. The boat leaves the Colman Dock at 5:45 P.M.

GROUP BREAKFASTS

AUGUST 19—8:00 A.M.

Accounting Section.
Sales and Advertising Section.
Technical Section.
Women's Committee.

GENERAL SESSION

AUGUST 19—10:00 A.M.

Olympic Bowl

National Advertising Enters its Second Year—J. S. Spaulding, Advertising Manager, Southern California Gas Co. and Member of National Advertising Committee.

Sampling Customer Thought — Harrison Musgrave, Assistant Personnel Manager, Southern Counties Gas Co.

Sales and Merchandising Trends in the Mass Market—W. C. Mainwaring, General Sales Manager, British Columbia Electric Railway Co., Ltd.

The Outlook for the Gas Industry—Floyd W. Parsons, Vice-President, Robbins Publishing Co.

GROUP LUNCHEON

AUGUST 19—12:15 P.M.

PARALLEL SESSIONS

MANUFACTURERS' SECTION

AUGUST 19—2:00 P.M.

Welcome to Seattle—Jas. F. Pollard, President, Seattle Gas Co.

Address of General Chairman—W. J. Bailey, President, Day & Night Water Heater Co.

The A.G.A.E.M. and Its Work—W. T. Rasch, President, Association of Gas Appliance and Equipment Manufacturers.

Report of Nominating Committee—L. B. Peeples, Chairman, Vice-President, Crane Co.

Research on Domestic Gas Appliances—F. O. Suffron, Supervisor, Pacific

*A digest of this paper is published in this issue.

Coast Branch, American Gas Association Testing Laboratory.

Three Men in a Boat—A. F. Rice, Manager Market Development, Southern California Gas Co.

Open Forum.

SALES and ADVERTISING SECTION

AUGUST 19—2:00 P.M.

Bert W. Reynolds, General Chairman
Pacific Gas and Electric Company

Air Conditioning Opportunities Are Here Now†—J. A. Hill, Pacific Gas and Electric Co.

A Method of Supervising Commercial and Industrial Sales Work—L. J. Brundige, Pacific Gas and Electric Co.

Advertising Your Gas Company Through Home Service—Victoria Warner, Southern California Gas Co.

Review of National Progress in Home Service—Beatrice Strege, Seattle Gas Co.

Selling the Gas Cookery Idea Through Advertising—Warren Kraft, Vice-President, Erwin, Wasey & Co.

TECHNICAL SECTION

AUGUST 19—2:00 P.M.

Otto Goldkamp, General Chairman
San Diego Consolidated Gas and Electric Co.

Purging a Gas Transmission Line—A Motion Picture. Prepared by F. F. Doyle and F. E. Wilson, Pacific Gas and Electric Co.

Operating Results—New Jones Oil Gas Process at Honolulu—L. B. Jones, Consulting Engineer, and E. S. Jones, General Superintendent, Honolulu Gas Co.

Gas Company Gas Appliance Testing Laboratories—A Report prepared by the Sub-Committee on Gas Appliance Testing—R. I. Snyder, Southern California Gas Co., Chairman.

Report of Pressure Piping Code Committee—D. H. Perkins, San Diego Consolidated Gas and Electric Co., Chairman.

Automatic High Pressure Valves on a 300-Foot Lift Span Bridge*—F. E. Reed, British Columbia Electric Railway Co., Ltd.

A Method for Testing Oil Mains and Services at Several Times Their Normal Operating Pressures†—E. R. Ames and W. L. McKee, Southern Counties Gas Co.

WOMEN'S COMMITTEE

AUGUST 19—2:00 P.M.

Doris Allen, Chairman
Southern California Gas Company

Northern Lights

As viewed from Seattle — Loretta Crowley, Chairman, Women's Committee, Seattle Gas Co.

As viewed from Spokane—Molly McCormack, Chairman, Women's Committee, Spokane Gas and Fuel Co.

As viewed from Tacoma — Dorothy Ollar, Chairman, Women's Committee, Washington Gas and Electric Co.

Trilogy

Public Relations Are Always With Us—Vivian Kirkpatrick, Chairman, Women's Committee, San Diego Consolidated Gas and Electric Co.

Now It Can Be Told—Zita O'Connor, Chairman, Women's Committee, Pacific Gas and Electric Co.

It's a Sale—Marie Haile, Chairman, Women's Committee, San Joaquin Light and Power Corp., and Cleora Cole, General Chairman, Women's Committee, Southern Counties Gas Co.

ANNUAL BANQUET

AUGUST 19—6:30 P.M.

Spanish Ball Room

Followed by Dancing in the Olympic Bowl.

Music by Archie Loveland's Olympic Hotel Orchestra.

Entertainment featuring Alice Corlett and the Varsity Male Quartet.

ESPECIALLY FOR THE LADIES

AUGUST 17—3:00 P.M.

Tea and Reception — Olympic Palm Court.

AUGUST 18—12:00 NOON

Putting Contest and Luncheon—Inglewood Golf Club. Followed by sight-seeing drive in and around Seattle. Automobiles will leave Seneca Street entrance of Olympic Hotel promptly at 12:00 noon.

AUGUST 19—12:00 NOON

Luncheon and Bridge — Seattle Golf Club. Automobiles will leave the Seneca Street entrance of Olympic Hotel promptly at 12:00 noon.

Norman McKee Nominated as 1937-38 P. C. G. A. Leader

THE General Nominating Committee of the Pacific Coast Gas Association will make the following nominations at the opening session of the 44th Annual Convention at Seattle on August 17:

For President—N. R. McKee, vice president, Southern Counties Gas Co., Los Angeles, Calif.

For Vice President—H. L. Farrar, president, Coast Counties Gas and Electric Co. and Natural Gas Corp. of California, San Francisco, Calif.

For Treasurer—D. G. Martin, general auditor, Pacific Gas and Electric Co., San Francisco, Calif.

For Directors—(regular two year term)—E. H. Coe, president, Central Arizona Light and Power Co., Phoenix, Ariz.

Addison B. Day, chairman of the board, Southern California Gas Co., Los Angeles, Calif.

L. M. Klauber, vice president, San Diego Consolidated Gas and Electric Co., San Diego, Calif.

W. G. Vincent, Jr., vice president, Pacific Gas and Electric Co., San Francisco, Calif.

For Directors—(to fill unexpired term of Mr. Farrar)—John J. Winn, Jr., commercial manager Portland Gas and Coke Co., Portland, Ore.

Outgoing President Jas. F. Pollard of Seattle automatically becomes a member of the Board of Directors.

Members of the nominating committee include the following: Wm. Moeller, Jr., chairman, Los Angeles; R. E. Fisher, San Francisco; Geo. Hammer, Oakland; F. C. Packer, Los Angeles; and W. F. Raber, San Diego.

Manufacturers' Nominations

The Nominating Committee of the Manufacturers' Section of the P. C. G. A. will make the following nominations at the Annual Meeting of the Section to take place in Seattle, August 19:

General Chairman—C. R. Graham, Jas. Graham Manufacturing Co.

Vice Chairman—R. G. Logue, Ward Heater Company.

Furnace Division: Chairman—W. W. Norton, Electrogas Furnace and Mfg. Co. Vice Chairman—A. J. Hartfield, Pacific Gas Radiator Co.

Range Division: Chairman — Geo. Hammer, Hammer-Bray Co. Vice Chairman—R. J. Merritt, O'Keefe & Merritt Co.

Space Heater Division: Chairman—J. S. Andrews, Andrews Heater Co. Vice Chairman—R. E. Fraser, Fraser Furnace Co.

Water Heater Division: Chairman—W. R. Smith, Continental Water Heater Co., Ltd. Vice Chairman—F. J. Brombacher, Superbo Mfg. Co.

Directors of A.G.A.E.M.: C. R. Graham and R. G. Logue.

Members of the nominating committee include the following: L. B. Peeples, Crane Co.; C. A. Miller, Servel, Inc.; and R. E. James, Grayson Heat Control, Ltd.

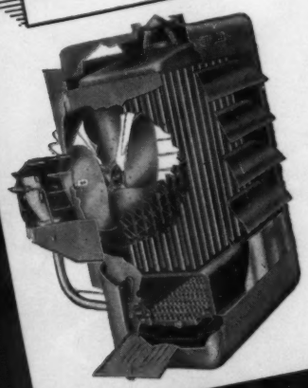
* A digest of this paper is published in this issue.
† Published in full in this issue.

Announcing- The NEW HUMPHREY GAS UNIT HEATERS

★ RESTYLED
★ NEW MECHANICAL REFINEMENTS
★ NEW CAPACITIES

Gas Unit Heater engineering experience of ten years has now been combined with the talents of modern designers to bring you the most beautiful and efficient line of unit heaters yet offered for industrial and commercial heating.

This illustration shows the simple, streamline casing that now entirely incloses the heater, which with its durable rich Ivory Baked Enamel finish presents for the first time a gas unit heater that blends harmoniously with the decorations of the smartest shops.



All the time-tested reliable mechanical features, that have been progressively engineered ever since we developed the gas unit heater, have been retained in these new models. The cross section view shows the sturdy construction throughout. Note the built-in down draft diverter, the heavy steel base casting, the new dynamically balanced fan and other advanced features.

New sizes with input ratings, ranging from 65,000 to 400,000 B.t.u. per hour, now give you a variety of models that can handle any heating need, and prices on a capacity basis are the lowest they have ever been.

These new beautiful, quiet Humphrey Gas Unit Heaters are ready to fit into your promotion plans for a real load-building campaign. Send today for our new Forced Circulation Heating Equipment Catalog.

A HUMPHREY PRODUCT

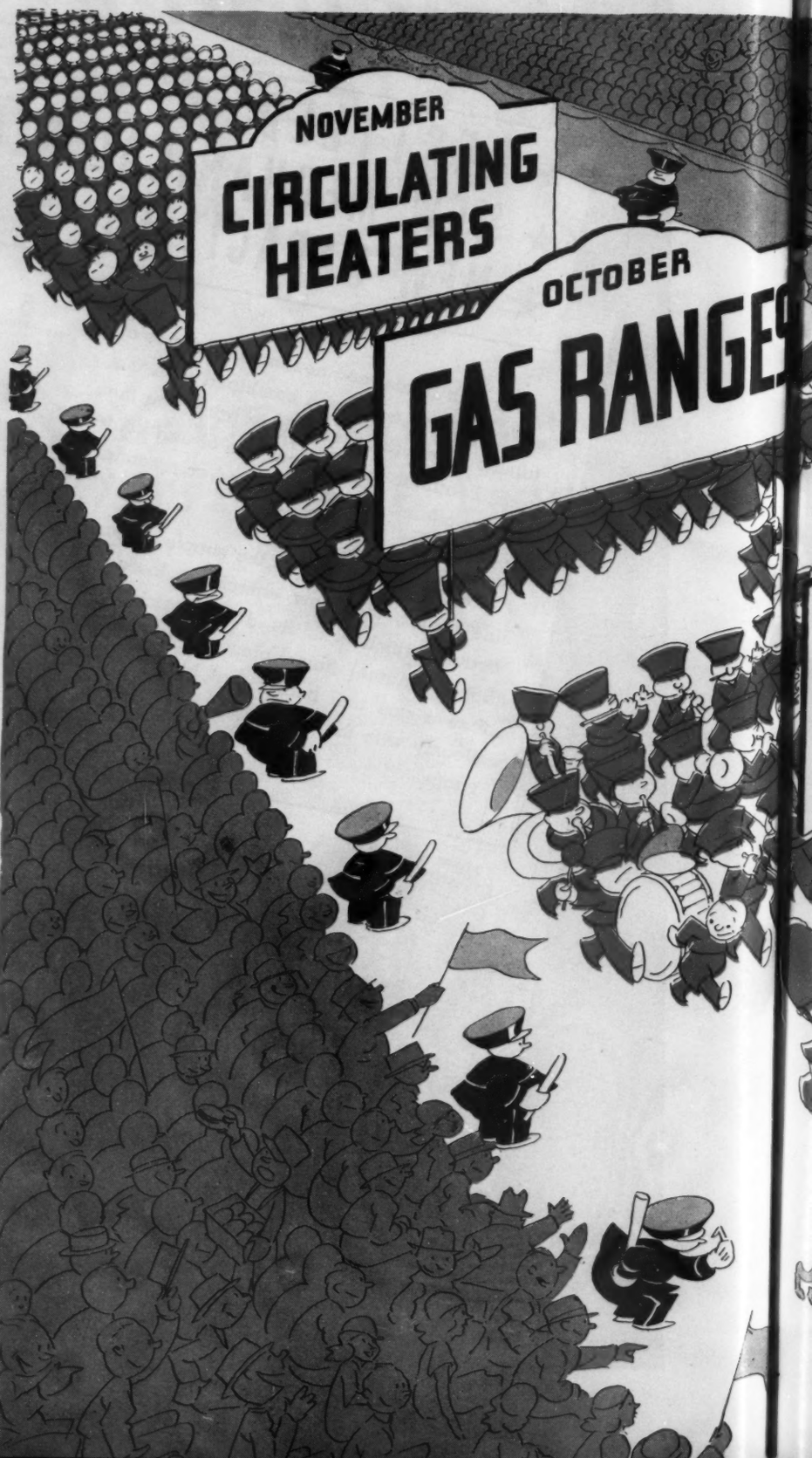
GENERAL GAS LIGHT COMPANY
KALAMAZOO, MICHIGAN

EASTERN OFFICE
23 WARREN ST., NEW YORK CITY

WESTERN OFFICE
475 ELEVENTH ST., SAN FRANCISCO

HERE THEY

THREE MORE MONEY-MAKING OPPORTUNITIES FOR GAS APPLIANCE DEALERS IN P. G. and E. TERRITORY



THE PARADE OF SALES PROMOTIONS agreed upon for 1937 is moving forward without a hitch.

Two "divisions"... gas ranges and gas water heaters have already passed.

Three more... general heating equipment, ranges and circulating heaters are rapidly approaching and dealers who intend to participate are already thinking of ways and means to tie in.

If you are interested in more business through concerted, organized, "united industry" selling, you will have your stocks in order and your advertising in shape for publication on the very first day of each campaign.

If you are new to the "united industry" technique, we suggest that you investigate the results of previous campaigns.

THESE RESULTS PROVE that selecting a particular appliance and then joining forces in a mass attack DOES produce business... *and in profitable ratio to the time and money expended!*

P·G·and E·

PACIFIC GAS AND ELECTRIC COMPANY

Owned-Operated-Managed by Californians

GOLDEN GATE INTERNATIONAL EXPOSITION 1939

COME
3 MORE UNITS
IN THE
PARADE OF
PROMOTIONS
FOR 1937
AUGUST
GAS HEATING
WATER HEATERS
GAS RANGES

Approved Appliances To Display A. G. A. Seal on Tag or Label

A TAG or label of approval will be prominently displayed after October 1 on all gas appliances approved by the American Gas Association Testing Laboratories, following adoption of the ruling by the A.S.A. Sectional Committee, Project Z.21, A. G. A. Approval Requirements Committee. This tag or label will be in addition to the permanent Seal of Approval carried on the appliance, and is to be attached to the front of the appliance in a conspicuous position.

Use of the tag will tie in with the national advertising campaign to promote the sale of approved gas appliances, according to an A. G. A. announcement. National advertisements appearing in magazines and trade journals carry the Laboratory Seal of Approval. Some of the advertisements incorporate a statement

The American Gas Association Testing Laboratories' seal of approval.

recommending that the buyer look for the Approval Seal, making it essential that the seal be visible on all approved appliances.

Differences in construction and manufacturing difficulties in placing name plates on finished enameled parts make it impractical, according to the committee, to designate a uniform location for display of the permanent Seal of Approval.

Cardboard tags in silver or white may be obtained in 2-inch size, and gummed labels in 1-inch, 1½-inch and 2-inch sizes from the American Gas Association Testing Laboratories, 1032 East 62nd Street, Cleveland, Ohio. Many manufacturers have been using the auxiliary tag and label forms since they were first made available at cost following a ruling in June, 1936, of the A. S. A. Sectional Committee, on gas-burning appliances.

Shortly before the ruling of the A. S. A. Sectional Committee, the Advisory Committee on Ultimate Consumer Goods of the American Standards Association recommended that the A. G. A. Laboratories' Seal of Approval be prominently displayed on approved goods. This recommendation followed a study by a subcommittee on gas appliances. The Advisory Committee had selected gas appliances as one of the first groups of commodities to study in view of the lead the gas industry has taken in developing standards for consumer goods.

■ ■

Campbell Succeeds Roraback As Head of Conn. Light

Charles L. Campbell, who has been an executive of Connecticut Light & Power Co. for many years, has been elected president to succeed the late J. Henry Roraback. Mr. Campbell is completing his twenty-sixth year with the company.

The new president, a native of St. John, New Brunswick, Canada, settled at Putnam, Conn., in 1901, as auditor for a firm of contractors engaged in building trolley lines in eastern Connecticut. In 1904 he became auditor of the Consolidated Railway Co., a New Haven Railroad subsidiary, and continued with the New Haven until 1911. For a year he was treasurer of the Dayton Power & Light Co., Dayton, Ohio, returning to Connecticut as secretary and treasurer of United Electric Light & Water Co., Waterbury. When this property became part of Connecticut Light & Power Co. in 1917, Mr. Campbell was made secretary and treasurer. He continued as secretary until 1929 when he was made vice-president. He continues as treasurer.

Mr. Roraback, who died on May 19, organized Connecticut Light & Power Co. in 1907. Two years before that he had organized Berkshire Power Co.

■ ■

Ottumwa Gas Co. Is Changing 4200 Meters to Natural Gas

Changing over approximately 4200 meters from manufactured to natural gas is now in progress in Ottumwa, Iowa, by the Ottumwa Gas Co. Many new meters are being added also. Merchandising plans of the utility are largely built around new stoves, water heaters, and refrigerators.

Gas served is 1040 B.t.u. The Ottumwa unit is 52,000 B.t.u., or 50 cu. ft. Domestic rates are (per unit): 20 units, 11 cents per unit; 80 units, 6.5 cents; all over 80 units, 3.5 cents. Commercial rates are (per unit): 20 units, 11 cents per unit; 80 units, 10.5 cents; 300 units, 8.5 cents; 400 units, 6.5 cents; 700 units, 5 cents; 2500 units, 4 cents; all over 4000 units, 3.5 cents.

G. C. Poust has joined the staff as industrial engineer. A natural gas engineer since 1919, Mr. Poust was formerly with the Iowa-Nebraska Light and Power Co., Lincoln, Neb., which, like the Ottumwa Gas Co., is a subsidiary of the United Light and Power Co.

■ ■

Twelve Niagara Hudson Properties To Merge

Merger of 12 operating gas and electric companies of the Niagara Hudson Power Corp. has been approved by the New York Public Service Commission. The new corporation will be called Consolidated Corp. Voting capital stock will be held by Niagara Hudson Power Corp.

The companies affected are Antwerp Light and Power Co.; Baldwinsville Light and Heat Co.; Fulton Fuel and Light Co.; Fulton Light, Heat and Power Co.; Malone Light and Power Co.; Northern New York Utilities, Inc.; St. Lawrence Valley Power Corp.; Norwood Electric Light and Power Co.; Syracuse Lighting Co., Inc.; Utica Gas and Electric Co.; Peoples Gas and Electric Co. of Oswego; St. Lawrence County Utilities.

At least $100,000,000 new capital will be needed for expansion during the next five years, according to testimony given at the hearings by Floyd L. Carlisle, chairman of the board of Niagara Hudson Power Corp.

■ ■

Lone Star To Generate Power For Its Dallas Building

Power for all uses in the Lone Star Gas Company building in Dallas, Texas, is to be generated by a 42,000-lb. 400-hp. gas engine and a 375 KVA generator which have just been placed in the basement of the building.

Engine and generator rest on a concrete block which in turn lies on a subfoundation. There are 12 dampers between. Each damper is made up of nine springs which absorb engine vibration. The engine foundation block measures 22 ft. 8 in. long by 8 ft. 3 in. wide and operates a fly wheel 5 ft. 5 in. in diameter, weighing 2,500 lbs.

■ ■

Frank E. Newberry Dies

The death of Frank E. Newberry has taken from the gas industry a well-known figure. Mr. Newberry, after practicing law in Chicago, became associated with the Peoples Gas Light and Coke Co., then manager of the Citizens Gas Co. of Kankakee, Ill., and of Insull properties at Dixon, Ill., and Green Bay, Wis. In later years he was New York manager for Equitable Meter and Manufacturing Co., and finally was with the Reynolds Gas Regulator Co.

■ ■

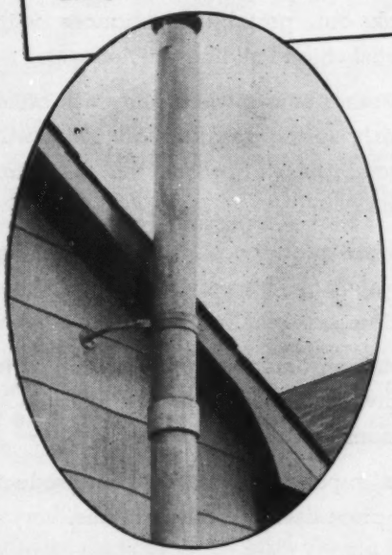
Thompson and Corr Advance

Van Thompson on July 1 became district manager of The Gas Company of New Mexico. Tom Corr replaced Mr. Thompson as field superintendent at Albuquerque.

It's easy to INSTALL this PERMANENT FLUE PIPE!

● *Above*, a typical Transite Flue Pipe job, installed with ease and speed, despite the many bends and small working area. *Below*, corrosion-resistant, weatherproof Transite Flue Pipe solves the outdoor venting problem permanently and economically.

Corrosion-resistant, weatherproof . . . J-M TRANSITE FLUE PIPE is provided with a complete line of fittings . . . and the new J-M Manual gives full data on its quick, economical installation



OBVIOUSLY, ease of installation is a major factor in selecting flue pipe. And just as obviously, flue pipe that offers this . . . PLUS PERMANENCE AND FREEDOM FROM MAINTENANCE AFTER INSTALLATION . . . provides advantages you can't afford to overlook.

Consider the facts on Transite Flue Pipe. Because there is a fitting for every type of job—regardless of how complicated the layout may be—assembly is invariably simple and rapid. Moreover, installation is further facilitated by a complete line of sizes, in both round and oval form.

And once installed, you can virtually forget about Transite Flue Pipe. Asbestos-cement in composition, Transite is inherently resistant to corrosive fumes, absolutely weatherproof. Its durability will serve as a lasting, trouble-free safeguard for the convenience of heating with gas!

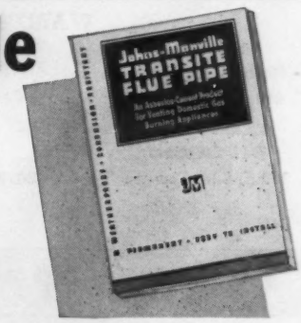
• • •

Furthermore, its relatively low heat conductivity keeps stack temperatures at a high level for long distances . . . minimizes condensation in the flue. Exceptionally resistant to high temperatures, Transite is approved by the National Board of Fire Underwriters! And its cost, considering *all* these evident advantages, is surprisingly low!

Johns-Manville

JM PRODUCTS

TRANSITE FLUE PIPE



Send for new, free manual

New 20-page manual tells how Transite Flue Pipe solves venting problems permanently and inexpensively. Also, information on installation methods and the use of Transite for chimney linings. G-8-37

JOHNS-MANVILLE, 22 East 40th Street, New York City
Send me your new 20-page manual on Transite Flue Pipe.

Name_____

Organization_____

Address_____

City_____ State_____

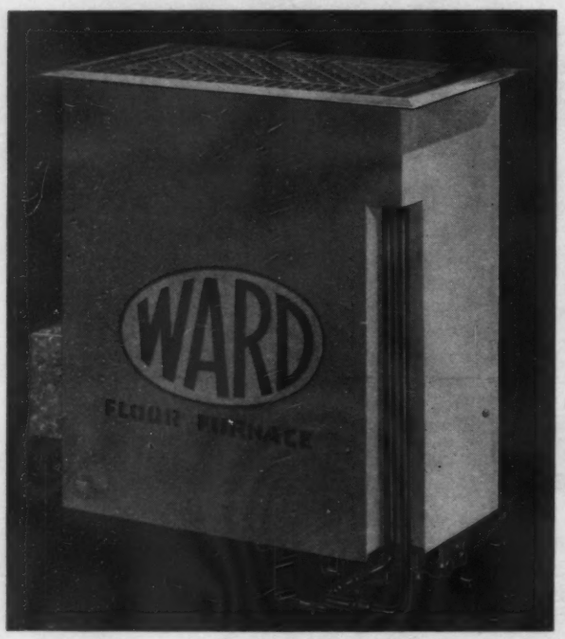
BUILD UP YOUR

Put WARD FLOOR

WARDS PERMANENTLY PROTECT LOAD

Guaranteed 10 years...built for a lifetime!

Occasionally utility executives say to us . . . "Why guarantee Ward Furnaces for ten years? It isn't necessary. They will sell just as well with a shorter guarantee." Our reply is that the facts of performance in thousands upon thousands of installations prove that Wards are good not only for the comparatively brief term of this guarantee, but for a *lifetime* of service, outlasting the buildings in which they are installed. We present these furnaces, embodying all the mechanical skill of our quarter-century's experience, and are proud to offer this tangible evidence of confidence in the quality of the merchandise we build.



Where

We have a lot of "salesmen" all ready to go to work building up your heating load. They are our 1937 Ward Floor Furnaces . . . and what a job they can do!

They are ready to go to work in homes along your lines, wherever winter warmth is now unsatisfactory. They will replace inefficient, easy-to-take-out, portable appliances with *permanent* load-building, satisfaction-building efficiency.

They are ready to help in other homes where they will build *auxiliary* heating load in early spring and late fall. They will bring special warmth to special rooms . . . rooms that are extra lived-in or extra hard to heat.

They are ready to solve the problem of heat in one-story stores, offices and shops that should be showing you a better profit than you are now getting.

And they will prove to your consumers, as they have in more than 325,000 installations giving excellent service today . . . that *gas is the efficient, economical fuel for heating.*

Get acquainted with these "super-salesmen" for your product. Write us today for catalog, price lists and other details.

WARD REPRESENTATIVES

NEW YORK	PITTSBURGH	CHICAGO
Herbert A. Lovell	H. C. Sanderson	J. E. Davies
455 Chanin Bldg.	207 Fulton Bldg.	Peoples Gas Bldg.
KANSAS CITY	**DALLAS**	**SAN FRANCISCO**
J. H. Stubbins	A. S. Kincaid	F. E. Reilly
300 E. 68th Terrace	2012 N. Harwood Ave.	200 Davis St.

YOUR LOAD IS AS GOOD AS THE APPLIANCE YOU SELL!

HEATING LOAD!

FURNACES *on your sales staff*

Why The biggest reason for putting Wards on your sales staff is their *permanence*. A Ward will build up your heating load not for one year but for many years to come. A Ward Furnace is built to last . . . a durable "complete package" of 16 and 18 gauge rust-resisting TONCAN IRON, with all controls and accessories sturdily built in . . . all materials the best that money can buy.

Reason No. 2 is Ward's sound heating principle. The diagram illustrates this and indicates, also, three exclusive Ward features, which are:

(1) WARD BILT-IN THERMO-CONTROL . . . a thermostat that is *part of the furnace* and contacts the air as it passes through, giving unusually accurate control of comfort.

(2) WARD CRADLE CIRCULATOR . . . insures steady air flow . . . increases heating efficiency as much as 20% . . . makes air movements steady, pleasant, continuous.

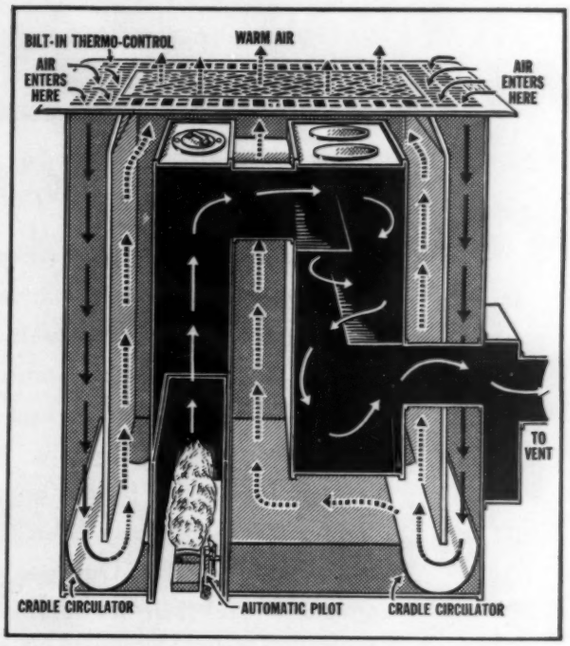
(3) WARD AUTOMATIC PILOT . . . an extremely sensitive safety device, proven in repeated tests far superior to other types of pilots . . . responds with amazing promptness to gas pressure changes.

These are a few of Ward's superior features. You should know the whole story about the advantages of having Ward Floor Furnaces on your sales staff. Why not write us today?

Factory and General Offices

WARD HEATER COMPANY

LOS ANGELES, CALIFORNIA



MORE THAN 325,000 INSTALLATIONS

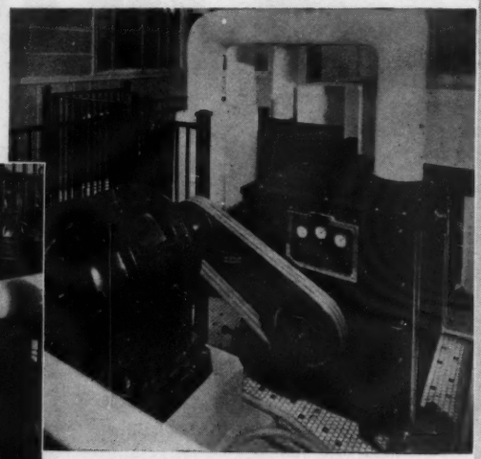
tell their load-building story

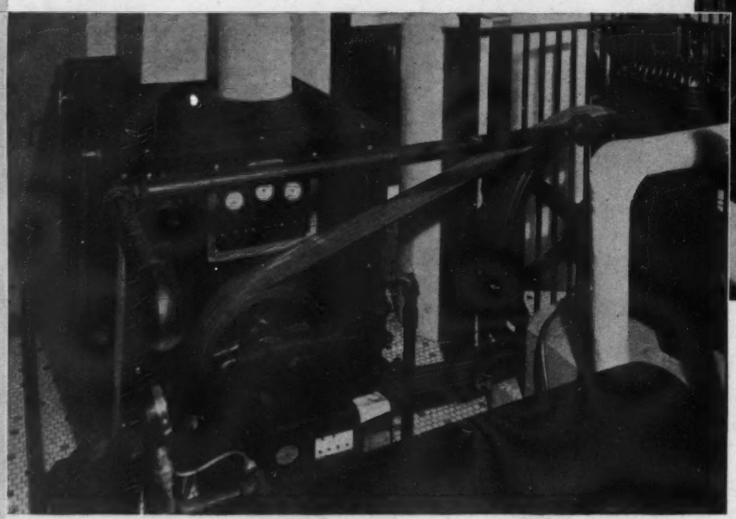
More utilities than ever before are building up their heating load with WARD FURNACES this year. Installation is simple, since the furnace is a compact "complete package," with all accessories built in. The WARD is dropped into the floor opening (where it hangs from joists beneath the floor) and is quickly connected with vent and gas line. No wires to run . . . no troublesome problems. An experienced gas fitter can have a WARD installed and at work in a few hours.

WARD HAS BUILT BETTER HEATING APPLIANCES SINCE 1909

BUILD A PROFITABLE LOAD

WITH WAUKESHA AUTOMATIC GAS ENGINES





Waukesha FCDU Deluxe Power Units driving compressor, and driving generator, in the modern showroom of the K. C. Gas Company, Kansas City, Missouri.

FOR AIR CONDITIONING, REFRIGERATION, AND EVERY POWER NEED

Gas powered air conditioning—commercial and residential! Waukesha gives every gas company the opportunity to build a new and highly profitable summer load.

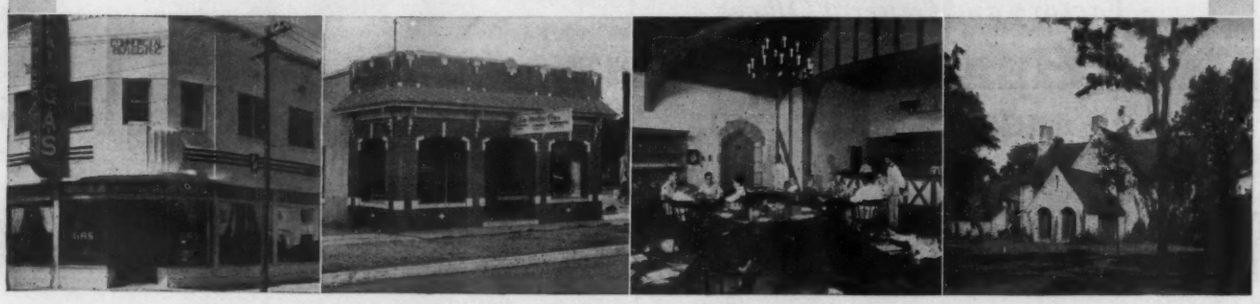
And an all year 'round load — using Waukesha gas - fueled power units for electric light and power generation. Chain stores particularly offer a tremendous potential market. One gas company reports a fuel bill for electric generation of less than one cent per kilowatt hour with a seven kilowatt plant.

Convince your prospects by demonstrating these Waukesha automatic gas engines right in your showroom. Smooth . . . quiet . . . handsome in appearance . . . they add a distinctly modern touch to your showroom display.

Waukesha Automatic Power Units are built in three sizes...10 hp to 67 hp...in the Deluxe sound-silenced, cushion - mounted design. Waukesha Standard Stationary Engines for gas, up to 350 hp. Write for Bulletin 1048.

GAS POWER DIVISION

WAUKESHA MOTOR COMPANY • WAUKESHA, WISCONSIN



Fort Wayne Changeover Plan By Indiana Public Service Co.

FIRST steps toward a proposed change from manufactured to natural gas in Fort Wayne, Ind., and nine surrounding towns are being taken by Northern Indiana Public Service Co., according to Dean H. Mitchell, vice-president and general manager. A saving of $100,000 would result to customers in the Fort Wayne system, it is estimated.

Northern Indiana Public Service Co. will first request permission of the communities to change to natural gas. These towns are, in addition to Fort Wayne, where 30,000 customers are served, Bluffton, Decatur, Columbia City, Roanoke, Ossin, Tocsin, Preble, South Whitley, and New Haven. After permission has been obtained, the contract between Northern Indiana Public Service Co. and the Michigan Gas Transmission Corp. will be submitted to the Indiana Public Service Commission.

Cost of the changeover will approximate $200,000, and will be borne entirely by the utility, according to Mr. Mitchell. The company already has lines carrying manufactured gas from Fort Wayne to surrounding towns in the Fort Wayne system.

■ ■

So. Counties Gas Co. Reduces Rates; Ends 3-Use Schedule

Rates of Southern Counties Gas Co., Los Angeles, Calif., were reduced, effective July 1, to bring savings to customers of $225,000 annually, according to President Wallace L. Ware of the California Railroad Commission.

The reduction in rates resulted from an informal investigation of the company by the Commission's staff, followed by negotiations for an adjustment in charges. Throughout Southern Counties' system the so-called "three-use" schedule has been eliminated, under which customers using gas for house and water heating and for cooking and whose bills were between $2 and $25 a month, were given a preferential rate. The new rates make these lower charges available to all domestic customers with bills over $2 a month.

■ ■

Daugherty Heads Industrial Relations for Empire Oil

R. J. DAUGHERTY

R. J. Daugherty has been made manager of the industrial relations division of Empire Oil & Refining Co., according to announcement by H. R. Straight, president. The appointment was effective July 1.

Since 1934, Mr. Daugherty has been in charge of public relations and advertising for the company. To these duties, will now be added supervision of first aid and safety, personnel, sale of coupon books, employee suggestion plan, and publication of the company's periodical, THE EMPIRE.

Mr. Daugherty has been with the company since 1926, first as salesman in the securities department, then director of public relations and later director of the information service department.

D. A. Howard, also on July 1, was transferred to the Oil Production Division to carry on special work under M. R. Shaffer, manager of the oil division.

C. E. Warren, who has been superintendent of the Kansas division of Empire, has been appointed general superintendent. He succeeds J. E. Howell, who resigned to become vice-president in charge of production for the Lion Oil & Refining Co. of El Dorado, Ark.

■ ■

Dan Hegarty Named Assistant To Laclede President

Dan A. Hegarty, public utility executive for nearly forty years, has been appointed assistant to President J. B. Wilson of The Laclede Gas Light Co., St. Louis, Mo. He was formerly with Central States Power & Light Co., operating the Missouri Electric Power Co.

D. A. HEGARTY

Mr. Hegarty received his engineering training at the University of Pennsylvania. Four years after graduation he was made vice-president and chief engineer of the American Engineering Co., constructors of gas and electric plants. Three years later he joined the Ford Bacon & Davis organization and was named vice-president and general manager of the Little Rock Railway and Electric Co., at Little Rock. He was later transferred to the New Orleans Railway Light and Gas Co. as general manager, and from there to the Houston Lighting and Power Co.

After war service, he took over the management of the Western Light and Power Co. at Boulder, Colo. When this property was sold to the Henry L. Doherty Co., Mr. Hegarty became affiliated with the Florida Public Service Co., a property of the General Gas & Electric Co. After two years, during which he bought properties for the company, he joined the American Gas & Power Co., operating gas properties at Jacksonville, Fla., Savannah, Ga., Birmingham, Ala., Minneapolis, Minn., and Lowell, Mass. His next connection was with Central States.

■ ■

Drillers Gas Co. Sells Kansas Properties to Gas Fuel Co.

Drillers Gas Co., Wichita, Kan., has sold its distribution system in Little River, Kan., and its franchises in Windom and Mitchell, Kan., to the Kansas-Nebraska Gas Fuel Co., Lexington, Neb., according to L. B. Stewart of Drillers Gas Co.

The Wichita company will continue to supply the gas for the three communities from the fields in Rice County, Kan. It also sells to the city of Lyon. From the Burrton field in Reno County, Kan., the company brings gas for the recently completed municipal plant at Moundridge, which expects to serve approximately 300 customers.

President Montgomery Resigns From American Pipeline Co.

H. L. MONTGOMERY, president since 1935 of American Pipeline Co., Bartlesville, Okla., has resigned because of ill health. His successor has not yet been selected.

H. L. MONTGOMERY

Before becoming president of American Pipeline Co., Mr. Montgomery was for ten years manager of Cities Service Gas Co., taking over this post when the distribution properties of the Empire companies were segregated and moved to Kansas City.

Mr. Montgomery entered the utility business in 1905 with the Denver Gas and Electric Co., which later became a part of the Public Service Co. of Colorado. In 1907 he accepted a position at Auburn, N. Y., and in 1911 became manager of that gas property. Later he was manager of properties at Newark, Ohio, and Atlantic City, N. J.

In 1919 he was appointed new business manager for the natural gas properties of the Empire companies, with headquarters in Bartlesville, and in 1920 was elected manager of the natural gas division, continuing in this position until he became manager of the Cities Service Co. in 1925.

He has been active in the Natural Gas Department of the American Gas Association and in the Oklahoma Utilities Association. He was manager of the latter's managing committee.

■ ■

Oklahoma Natural Buys Lines Of Independent Natural

Oklahoma Natural Gas Co., Tulsa, has completed purchase of, and is now operating, certain properties of the Independent Natural Gas Co., Bartlesville, Okla., following decision of the District Court, in a suit brought by the state, that the Independent Natural Gas Co. was not a competitor.

Property taken over includes approximately 175 miles of transmission line in the general Seminole area, according to W. Jennings Young, vice-president of Oklahoma Natural Gas Co. Independent's business, he states, consisted of sale of gas to drilling wells, connections at the city gate for various small towns, and service to domestic consumers along the various lines. The purchase does not include Independent Natural Gas Co.'s lines in and around Oklahoma City.

■ ■

Illinois Public Service Change

R. D. Maxson, division manager of Public Service Co. of Northern Illinois, Chicago, has announced three appointments in its western division, effective July 1. G. D. Carlson, formerly superintendent of the Elmhurst District, is now superintendent of the LaGrange district, following the death on June 10 of F. N. Leonard, former superintendent. H. R. Lisenby has been appointed superintendent of the Elmhurst district, and G. C. Bailey has been made assistant to district superintendent, Oak Park.

Shooting one of the scenes in "The House That Jack Built," new talkie about home and kitchen modernization with gas fuel equipment.

Story of Modern Gas Told in A. G. A. Sponsored Film

A NEW talking motion picture, "The House That Jack Built," produced by Mason Wadsworth under the sponsorship of the American Gas Association with the co-operation of *McCall's Magazine* and various manufacturers, is being used successfully by local gas companies to promote consumer interest in home and kitchen modernization with the use of gas.

Produced in Hollywood with a professional cast, the new talkie tells a romantic story that also presents the benefits of gas for cooking, house and water heating, air-conditioning, and refrigeration.

In the early part of the film an old house is completely remodeled and equipped with the latest gas appliances. Later in the film a new home is built in an exclusive residential neighborhood. It is also completely gas equipped.

The new talkie has already been bought or rented for exhibition before women's clubs, cooking schools, county fairs, church organizations and other consumer groups by local gas companies in all parts of the country. Lone Star Gas Company of Dallas, Texas, will run the new talkie as a feature in its exhibit at the Pan-American Exposition.

The new film is available in both the 35 and 16 mm. size and can be bought outright or rented through either Mason Wadsworth, the producer, at 551 Fifth Ave., New York, N. Y., or the American Gas Association, 420 Lexington Ave., New York. Projection equipment and service suitable for small showings or for use in motion picture theatres can be secured in almost any locality, it is stated.

Rice Takes So. Calif. Gas Co. Market Development Post

APPOINTMENT of A. F. Rice as manager of market development of the Southern California Gas Co., with headquarters in Los Angeles, has been announced by A. B. Macbeth, president of the company.

A. F. RICE

Mr. Rice will be concerned with the formulation of policies for co-operative sales conducted by gas appliance dealers, manufacturers and the Southern California Gas Co., under the supervision of F. M. Banks, vice-president in charge of sales.

Mr. Rice entered the home appliance industry as northern California representative of Cribben & Sexton Co. of Chicago, manufacturer of Universal gas ranges. He was transferred to Southern California to introduce that line in 1922.

In 1924, while still retaining representation of Cribben & Sexton, Mr. Rice became manager of the Sunset Stove Stores, Los Angeles, and also the sales manager of Western Stove Co. at Culver City. In 1925 he resigned the other interests and devoted his full time to the management of the Western Stove Co.

In 1926 he joined the H. R. Basford Co. of San Francisco as sales manager. The company operates a wholesale and retail gas appliance business. In 1936 Mr. Rice became western district manager of the Kelvinator Corp. of Detroit, Mich., having charge of California, Arizona, and Nevada.

House Passes Lea Regulatory Bill

THE United States House of Representatives on July 1 by unanimous consent passed the Lea bill providing for regulation of natural gas companies engaged in interstate commerce. An identical bill has been introduced in the Senate.

The Lea bill (H.R. 6586) confers upon the Federal Power Commission jurisdiction over the transportation of natural gas in interstate commerce and the sale in interstate commerce of natural gas for resale for ultimate public consumption for domestic, commercial, industrial, or any other use.

The bill would prevent new companies from entering a territory already served by a natural gas company, and would require a company to extend or improve its facilities and to establish connection and sell natural gas to any company or municipality engaged in the distribution of gas if such extension or improvement is to the public interest; but the Commission is not given power to compel extension if existing service would be impaired.

Clarence F. Lea, representative from Missouri, is author of the bill.

■ ■

Philadelphia Co. Uses "Pops"

Philadelphia Co., Pittsburgh, Pa., on July 6 started a series of open-air "pop" concerts by a 35-piece orchestra. The concerts are given in Schenley Park from 7:15 to 8:45 p.m. (daylight saving time). They are broadcast over KDKA.

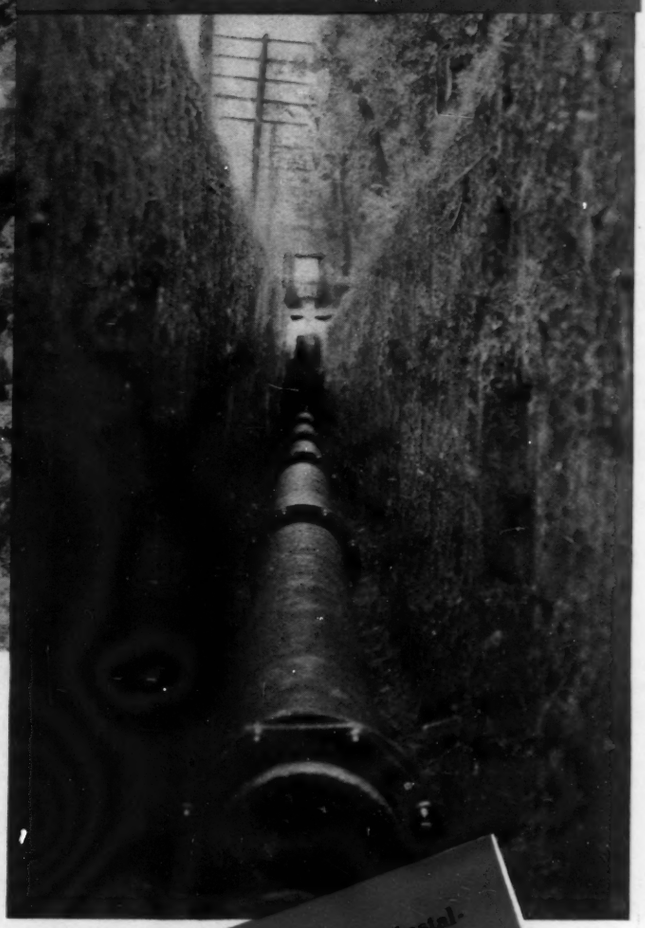
THEN . . .

The same long-lived material

100 YEARS AGO—A cast iron gas main which has been in service in Baltimore for more than a century.

and NOW

but with modern mechanical joints



TODAY—A recent installation of mechanical joint cast iron pipe replacing a gas main of shorter-lived material.

One of the factors in economical gas distribution which is a *constant*, is cast iron pipe. The experience of a century attests its enduring service. With modern mechanical joints, this most economical material offers greater efficiency to match modern operating conditions. These joints, as made by C. I. P. R. A. members, are bottle-tight. Mechanical joint pipe is made in diameters from 1¼ to 84 inches.

CAST IRON PIPE

THE STANDARD MATERIAL FOR UNDERGROUND MAINS

The Cast Iron Pipe Research Ass'n, Thos. F. Wolfe Research Engr., 1013 Peoples Gas Bldg., Chicago

N. C. McGOWEN

C. N. LAUER

R. W. HENDEE

A. G. A. Officers Nominated; Convention Topics Outlined

A PROGRAM of wide appeal, reflecting the growing attention to competitive problems and the economics of the gas industry, is now rapidly being completed for the 19th annual convention of the American Gas Association to take place in Cleveland, Ohio, September 27 to October 1. Thousands of gas men, representing all phases of the industry, are expected to attend, according to reports from Association headquarters.

Holding the spotlight during the Cleveland meetings will be the A. G. A. Testing Laboratories. These laboratories, which are organized throughout the world as one of the most unique examples of industry self-regulation for customer protection, represent an investment of thousands of dollars by the gas industry and include apparatus unduplicated anywhere. A full morning on the convention program will be devoted to a visit to the laboratories and to an inspection of their facilities.

Playhouse Square in Cleveland, scene of the 19th Annual American Gas Association Convention next month.

Sessions of the convention will be divided between the Statler and the Cleveland Hotels. General sessions and the Commercial and Industrial Gas Section meeting will be held at the Statler Hotel. The President's Dinner and other executive functions as well as the Natural Gas Department, Technical, and Accounting section meetings will take place at the Cleveland Hotel.

Highlights on the general sessions programs will be the keynote speech of the Association's president, Herman Russell, a discussion of the "Home of Tomorrow" as it relates to the industry; and, with the inauguration of the second year of the national advertising campaign, a presentation under the general topic, "Telling the Story of Gas Nationally," is expected to attract wide interest.

The Nominating Committee of the Association last month selected the following men as nominees for Association offices to be presented before the convention:

For President—N. C. McGowen, president, United Gas Public Service Co., Shreveport, La.

For First Vice President—Conrad N. Lauer, president, The Philadelphia Gas Works Co., Philadelphia, Pa.

For Second Vice President—Walter C. Beckjord, vice president, Columbia Gas and Electric Corp., New York.

For Treasurer—J. F. Rooney, assistant to executive vice president, Consolidated Edison Co. of New York, N. Y.

For Directors—2-year terms: F. H. Adams, vice president, Surface Combustion Corp., Toledo, Ohio.

Charles M. Cohn, vice president, Consolidated Gas, Electric Light & Power Co., Baltimore, Md.

J. S. DeHart, Jr., president, Isbell-Porter Co., Newark, N. J.

L. B. Denning, president, Lone Star Gas Co., Dallas, Texas.

C. E. Gallagher, president, The East Ohio Gas Co., Cleveland, Ohio.

George S. Hawley, president, Bridgeport Gas Light Co., Bridgeport, Conn.

B. J. Mullaney, vice president, The Peoples Gas Light and Coke Co., Chicago, Ill.

Otto Snyder, president, New York Power & Light Co., Albany, New York.

T. J. Strickler, vice president, Kansas City Gas Co., Kansas City, Mo.

In line with the practice of the Nominating Committees for the past four years the Committee for 1937 voted unanimously not to name a candidate for the Third Vice President.

The following members have been nominated by section nominating committees to serve as section officers for the next Association year:

Natural Gas Department: For Chairman—Robert W. Hendee, Colorado Interstate Gas Co., Colorado Springs, Colo. For Vice Chairman—Thomas R. Weymouth, Columbia Gas & Electric Corp., Pittsburgh, Pa.

Accounting Section: For Chairman—D. H. Mitchell, vice president and general manager, Northern Indiana Public Service Co., Hammond, Ind. For Vice Chairman—H. A. Ehrmann, Consolidated Edison Co. of N. Y., New York, N. Y.

Commercial Section: For Chairman—Hugh Cuthrell, vice president, The Brooklyn Union Gas Co., Brooklyn, N. Y. For Vice Chairman—F. X. Mettenet, vice president, The Peoples Gas Light & Coke Co., Chicago, Ill.

Industrial Gas Section: For Chairman—Hale A. Clark, Detroit City Gas Co., Detroit, Mich. For Vice Chairman—Frank H. Trembly, Jr., The Philadelphia Gas Works Co., Philadelphia, Pa.

Manufacturers' Section: For Chairman—Merrill N. Davis, vice president, S. R. Dresser Manufacturing Company, Bradford, Pa.

Publicity and Advertising Committee: For Chairman—Henry Obermeyer, assistant vice president, Consolidated Edison Co. of N. Y., Inc., New York, N. Y.

Technical Section: For Chairman—J. V. Postles, assistant to vice president, The Philadelphia Gas Works Co., Philadelphia, Pa. For Vice Chairman—F. M. Goodwin, vice president, Boston Consolidated Gas Co., Boston, Mass.

■ ■

So. Counties Builds Office

Southern Counties Gas Co., Los Angeles, Calif. is constructing a $7,000 branch office in Huntington Beach, Calif. The building will be of modern design.

IT'S MUSIC TO OUR EARS

Enthusiastic Dealers Sing Praises of

ROPER

Not our words... but actual statements made by **ROPER** *Gas Range Dealers!*

"We try to sell quality merchandise and ROPER has IT" — CAL.

"None better for price, convenience, style, quality" — N. J.

"They are the best stoves for bottled gas operation" — ILL.

"The 1937 ROPER is desirable . . . . modern!" — PENN.

"Eye-appeal, construction, and practical efficiency" — OHIO

"More selling and service features to help dealers" — TEXAS

"ROPER is without a doubt America's finest range" — IND.

Complete Advertising and Sales Promotion Helps and Service yours for the asking . . . Let us show you

Tie in with the ROPER National Advertising Program

ROPER RANGES ARE IDEAL FOR USE WITH ANY TYPE OF GAS, INCLUDING BOTTLED GAS

GEO. D. ROPER CORP.

GENERAL OFFICES AND PLANT: ROCKFORD, ILL.

WAREHOUSES:

San Francisco, Los Angeles, Dallas, Kansas City, Chicago, Washington, Atlanta, Cleveland, Newark, Philadelphia

Paul Leary (right), elected mayor of the mythical city of McKeeville in a "reconnect" campaign conducted by employees of Portland (Ore.) Gas & Coke Company, receives the key to the city from C. R. Johnson of the contract bureau. In the background is a chart showing the holder construction project which featured the campaign.

Portland Gas Co. Employees "Reconnect" 2317 Services

By DONALD M. JOHNSTON
Portland Gas & Coke Company

A "RECONNECT" sales campaign that brought in 2317 customers —only 249 of them classed as seasonal—was completed early this spring by the 700 members of the Portland Gas & Coke Co. organization, Portland, Ore.

The campaign lasted from January 11 to March 27 and included the communities of Oregon City, Salem, Albany, Corvallis, Hillsboro and Newberg, which, with Vancouver, Wash., are served by the Portland utility.

Conducted by employees and with only an ordinary schedule of general consumer advertising, the expense of the campaign was low indeed when compared with the $66,566.00 of estimated annual revenue which it produced. Largest item of expense was the $2317 in $1 cash bonuses, while incidental expenses included bulletins, cash prizes, a luncheon and a closing ceremony for captains, winners, etc.

In immediate charge of the campaign was William A. Warner, employee sales co-ordinator, under whose leadership the 11 teams went over the top. As a matter of fact the employee organization, of which the company long has been justly proud, became so sales minded that it passed its quota by 15.8 per cent. Regular employees accounted for 1462 customers as compared with 855 by the salesmen.

Purpose of the campaign was to capitalize on an off-peak merchandise season by concentrating the entire company's attention on securing new customers, reconnecting seasonal customers prior to the expected seasonal turn-on and the connecting of additional appliances.

Company salesmen followed their regular routine, while the general employees worked through their prospect team organization. Vehicle or background for the campaign was the mythical city of McKeeville, named after Paul B. McKee, company president, and the object of the contest was to construct a gas holder with a storage capacity capable of supplying gas service to the town's inhabitants.

The various teams were given names such as "Bailey's Blacksmiths," "Miller's Machinists," etc., named after the captains and in keeping with the holder construction theme. Eleven teams made up the competition and each was given its share of a grand quota of 48,000,000 cu. ft. of gas. This was based on the sale of 2,000 units at an average consumption of 24,000 cu. ft. per year per unit. It was this quota of 2,000 units that was exceeded by 15.8 per cent.

General company advertising during the campaign stressed cooking service, while window displays and sales floors gave special emphasis to cookers, hotplates, tank water heaters and other small appliances.

There were also certain financial inducements which the employees could offer to prospective customers, such as connection at actual cost of appliances not in use; no deposit on residential applications from customers with established credit; and a special offer to former customers whose service was discontinued at least 60 days prior to the date of new application.

However, in this campaign prospects or leads counted nothing. As a matter of fact an employee was obliged to bring in a signed application himself, regardless of any previous contacts. Credit was allowed an employee adding an appliance to his own home, the same as an outsider. Credit also was allowed for the reconnection of an additional appliance to be used with an existing meter.

Each team was furnished with a large board, an exact replica of a gas holder, on which the various teams had their respective areas of "construction work" corresponding to their quotas. At the close of each day the captains were notified which units to block in with proper colors. A gage by the side of the holder showed a vertical line rising to indicate the progress of the campaign as a whole.

Frequent bulletins and the miniature "McKeeville Times" made their appearance off and on during the contest and carried stories of team standings as well as those of high individuals.

The climax to the campaign was a large luncheon, the awarding of cash prizes and the installation of the captain of the winning team as mayor of McKeeville, all with great and due ceremony. A city council made up of the captains of the next five high teams was also installed. This group of officials will rule the mythical city until next year when in all probability the "McKeeville Gas Company" will feel the need for still further expansion.

"It was a mighty good job!" stated Paul B. McKee, president of the Portland Gas & Coke Co., at the installation luncheon in congratulating the workers who helped place plates on the holder which symbolized the building of company load. John J. Winn, Jr., commercial manager, was equally enthusiastic over the outcome of the campaign.

Northern Natural Builds Two Iowa Compressor Stations

TWO compressor stations are under construction by Northern Natural Gas Co. of Omaha, Neb., at points near Oakland and Ventura, Iowa, according to Joe T. Innis.

At the Oakland station, about five miles from town on U. S. Highway No. 6, two 900-hp. twin tandem double-acting Worthington units will be installed this year. Provisions are being made for installing a third unit later. Construction started in April and the station is expected to be ready for operation by September 1. It will make possible increased capacity of Northern Natural's pipe line for gas distribution in northern Iowa and southern Minnesota.

Three 800-hp. twin tandem double-acting Cooper-Bessemer units will be installed at the compressor station located between three and four miles northwest of Ventura. This station was made necessary by increased demand in southern Minnesota. Construction is to be completed by September 15.

For auxiliary power at the stations Northern Natural Gas Co. has purchased four 150-hp. Worthington auxiliary generating units. All units will use natural gas for fuel.

A feature of the two stations, resulting from the company's experience with Iowa water, is the closed jacket water cooling system, to make possible a closer control of jacket water for the engines. Two 12-bay Fluor cooling towers have been erected.

■ ■

R. M. Conner Awarded Degree By Oregon State College

R. M. Conner, director of the A.G.A. Testing Laboratories in Cleveland, Ohio, has been awarded a professional degree in Mechanical Engineering (M.E.) by Oregon State College, Corvallis, following acceptance of his thesis, "Development of an Accurate Method for Testing Warm Air Furnaces."

Mr. Conner was graduated from Oregon State College in 1915, with the degree of Bachelor of Science in Civil Engineering. He is a member of Phi Kappa Phi and Tau Beta Phi, and in May of this year was elected to Sigma Xi, highest national honorary fraternity open to engineers.

Mr. Conner organized the Testing Laboratories in 1925.

■ ■

P. G. and E. Now Delivering Through New Rio Vista Line

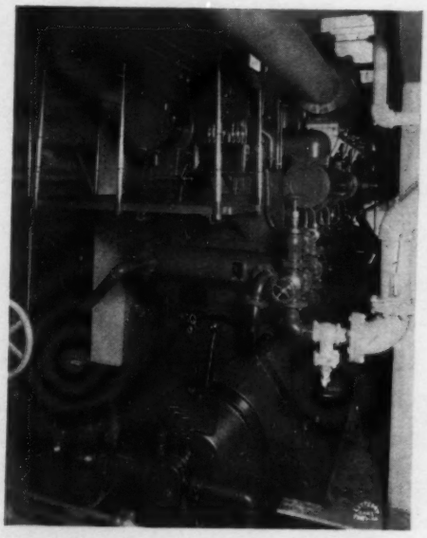
Pacific Gas and Electric Co. started in mid-July delivering gas from its Rio Vista field through one of its new pipelines, to the Spreckles Sugar Refinery at Woodland, Calif.

The refinery has just been constructed in the heart of the beet sugar country in Northern California. It will handle about 2500 tons of beets per day during the beet season. Natural gas boilers will be operated under 250 pound superheated steam. It is expected that when the plant is in full operation its efficiency should be greater than any other now operating.

Prison Gas Power Plant Operated by Inmates

THE Texas State Farm Industries near Sugarland, Texas, have their own gas-electric generator to supply current for all uses of electricity on the State Farms of several thousand acres, and the prime mover by which this generator is driven is a gas engine, operated with prison labor. A steam engine was formerly used, but it was displaced in 1935 because of an anticipated reduction in cost of power and also because simplicity of operation was regarded as important for a plant manned as this one is, with prison inmates. Under the supervision of a capable plant superintendent, long-term prisoners are assigned as operators, are granted opportunity to become proficient in handling the machinery, and are rewarded for satisfactory service in the power house by corresponding reduction of their prison terms. Men are found eager to take advantage of such a plan, the economies hoped for have been realized, and the management is well pleased with the results of the departure made two years ago.

Light, power, and refrigeration are all supplied from the one source. Within the prison enclosure, always brilliantly illuminated at night, are a group of buildings which include a packing house, a cannery, and a warehouse, besides necessary housing for the inmates. Outside the enclosure are cotton gins, a brick plant, and other operations requiring light and power. The farthest point to which current is transmitted is two miles from the power plant.



Gas engine—Cooper-Bessemer Type LR-6—in power house of Texas State Farm Industries, Sugarland, Texas.

The power unit employed is a Cooper-Bessemer gas engine with 600 rated hp. at 277 r.p.m., direct-connected to a 2300-volt AC generator. The actual power developed by this engine on a water-brake test at rated speed, the manufacturers report, was 743 B.hp. The power installation is regarded as a model one and the management of the enterprise as a whole is very successful, the aim, as everywhere in the Texas prison system, being to make the institution self-supporting.

■ ■

Central West Utility Builds Into Green Haven Area

Central West Utility Co., Kansas City, Mo., is constructing 17,000 ft. of 2-, 3-, and 4-inch pipe in the Green Haven area, a newly developed district between North Kansas City and Liberty, Mo., according to H. S. Green, manager. The territory has a potential market of several hundred consumers. Work is expected to be completed by early fall. The extension will be under the office at Liberty, of which E. L. Millis is manager.

Central West Utility Co. recently modernized its office at Bonner Springs, Kan., using knotty pine for wainscoating, counters, and other partitions, maple floors, and the latest design of gas lights. The office was entirely repiped, with all pipes hidden.

■ ■

Sturkey Succeeds Peirce As President of Ohio Company

J. A. Peirce, president, Gas Corp. of Michigan, Greenville, Mich., has resigned as president of Ohio Gas Light & Coke Co., a position he has held for some time, to give his time to his natural gas properties. Charles M. Sturkey, who for two years has been president of North Carolina Gas Co. has been elected president of the Ohio company to succeed Mr. Peirce.

■ ■

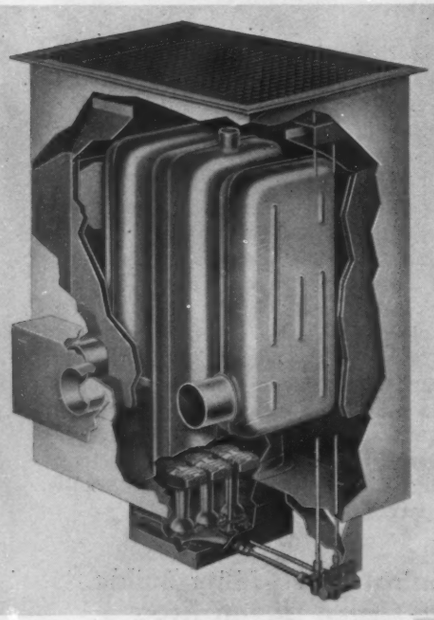
Gas Service Co. Appointments

E. B. Cool, who has been new business manager at Hutchinson, Kan., for The Gas Service Co., has been appointed to serve as new business representative in a number of smaller towns operated from the El Dorado office. Fred Cannon has been transferred from the office at Arkansas City to succeed Mr. Cool at Hutchinson.

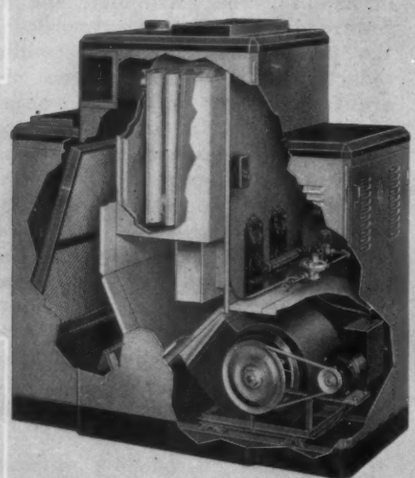
Payne MEANS..

A LOAD ON

A LOAD OFF

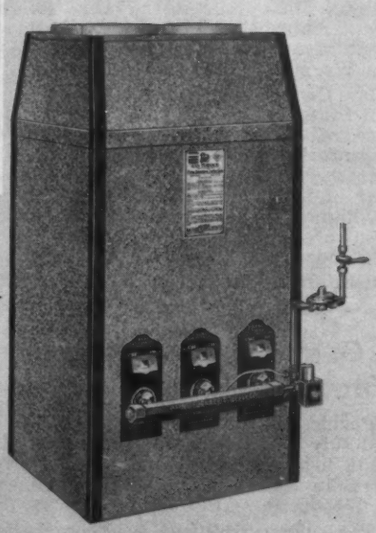


Payne Floor Furnace. One of the most economical and efficient floor furnaces ever built.



Beverlyair Unit. Payne's latest contribution to home comfort the year 'round. Heats in winter—ventilates in summer.

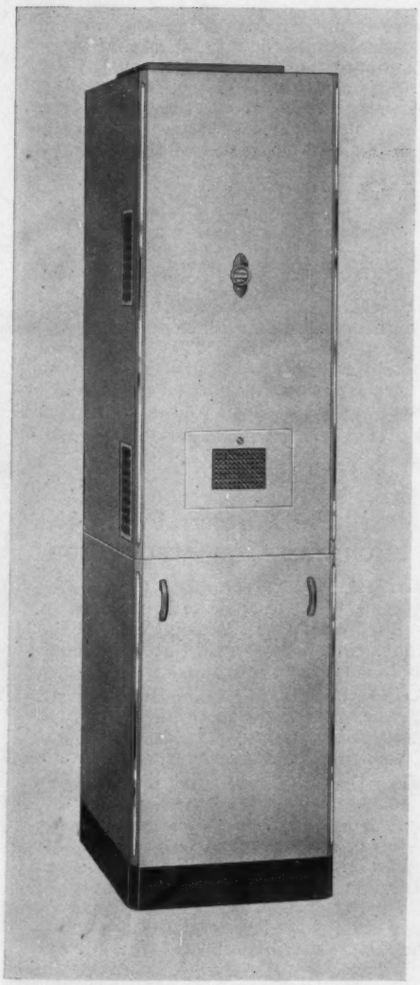
Payne Console Heater. A tremendously popular circulator, styled in harmony with modern architectural design.



Payne Series "A" (Unit) Furnace provides automatically controlled warmth for individual rooms or suites.

IN YOUR LINES...

OF YOUR MIND!



Payne FAU (Forced Air Unit). Heats in winter — ventilates in summer. Occupies about 4 sq. ft. of floor space.

Payne Furnaces are selling GAS by going out and proving its superiority as a fuel.

They are convincing new converts every day that GAS, used with properly designed, built and approved appliances, is the ideal fuel. Payne came by this ability to sell GAS through almost a quarter century experience in the making of gas-fired appliances *exclusively*.

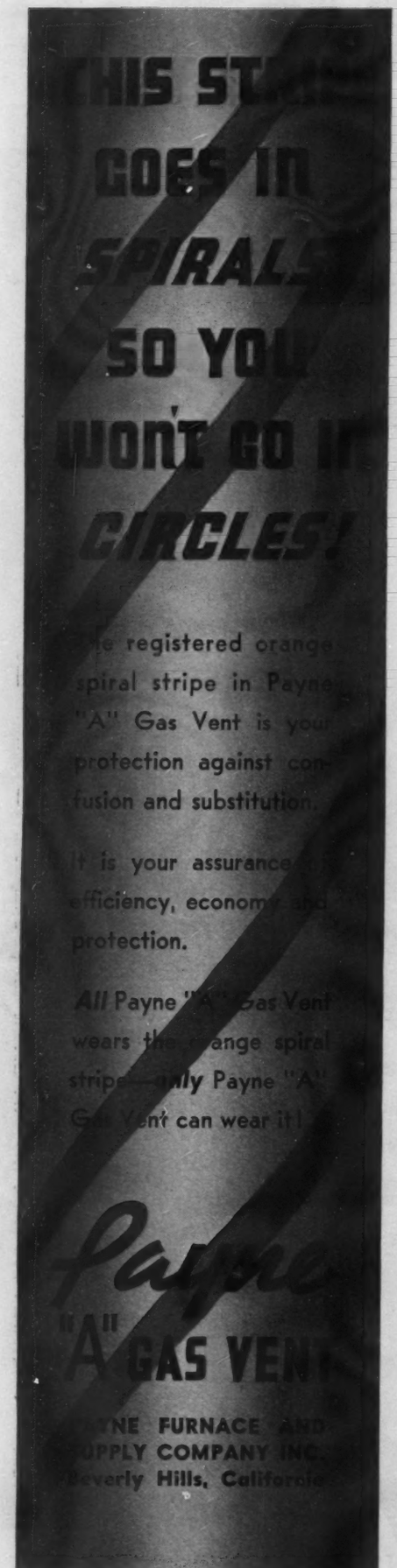
Payne appliances are made in America's most modern furnace plant. They are built to exacting specifications—designed to pass all Gas Association requirements with plenty to spare.

In use, these appliances are constant good-will builders for GAS and for Payne. There can be no other way to lasting success.

Payne

FURNACE & SUPPLY CO. INC.

BEVERLY HILLS • CALIFORNIA



Iowa City Light & Power Co. Starts Changeover Activity This Month

THE Iowa City Light & Power Co., in August, will begin in Iowa City, Iowa, the changeover from manufactured to natural gas supplied by the Natural Gas Pipeline Co. of America. This utility is the last of the United Light Properties in Iowa to change over to natural gas. Permission to do so is given in a recent ruling of the United States Circuit Court of Appeals, following litigation carried on for several years by municipal ownership proponents.

The changeover, according to Roscoe E. Taylor, general manager and vice-president of the Iowa City Light & Power Co., will be effected in one operation. The city has been divided into twelve districts for changeover purposes.

The company has been serving natural gas to its customers in two separately incorporated suburbs, University Heights and Coralville. The new fuel was brought into Coralville in 1934 and into University Heights in 1935.

The obstructive movement was started in 1932 when the company applied for a new franchise, proposing to substitute natural for manufactured gas. The proposition was defeated at the polls, but later the city council ordered the company to effect the changeover. The city engineer refused to issue the permit. Other factions then entered the controversy and several years of litigation followed.

Eventually the company's position was upheld by Special Master in Chancery Allen A. Herrick, then by United States District Judge Charles A. Dewey. The municipal ownership forces appealed from the ruling, but it was upheld by the Circuit Court of Appeals. Later they sponsored an appeal for a rehearing of the case but a new city administration withdrew the petition, and at the present time no substantial obstruction to the long awaited changeover exists, according to all reports.

Following Judge Dewey's decision, the company was permitted to bring its main into the city, and this was done in the fall of 1936, but the new fuel could not be served until a ruling on the appeal had been handed down. Since that time the company has made extensions of its distribution system to serve homes that have been built since litigation was started. More than 150 new customers will be added as a result of these extensions.

Sale of San Angelo Property To Lone Star Pending

Application is pending before the Securities and Exchange Commission for purchase of certain assets of Texas Public Service Co. and Texas Public Service Production Corp. of Austin, and West Coast Power Co. of New York City, by Lone Star Gas Corp. of Delaware and Lone Star Gas Co. of Dallas. Acquisition of the assets depends upon approval of the reorganization plan of Peoples Light & Power Corp., and this has not been finally adjudicated, according to George Otis Spencer, chief of the Commission's Utilities Finance Section. The reorganization program was approved by the federal court last December.

Properties included in the proposed purchase are the city distribution systems at San Angelo, Rowena, and Miles, with 5,500 meters in service, an 8-inch main line to Coleman county gas fields with gathering lines, a compressor station at Ballinger, a 12-inch pipe line to Texon, and an 8-inch line from Texon to the Girvin plant of the West Texas Utilities Co.

■ ■

K. C. Gas Co. Turns On Gas For Two Generating Stations

Kansas City Power & Light Co. is now using natural gas in its two large generating stations in Kansas City, Mo., with the completion shortly before July 1 of all construction work made necessary by the contract between the company and Kansas City Gas Co., which supplies the fuel. Gas is to be 40 per cent of the fuel requirements of the two generating stations.

Gas was first used under the boilers at the Second and Grand generating station soon after June 1. The last boiler that will use gas was turned on in the Northeast generating station on June 23.

Five miles of 24-inch pipe line were laid at various depths from 36 inches to 11 feet.

■ ■

Howard Pett Chosen President Of Michigan Gas Association

Howard Pett, Consumers Power Co., Lansing, Mich., was elected president of the Michigan Gas Association at the annual convention held at Mackinac Island, July 1, 2, and 3.

Arthur P. Eva, Michigan Fuel & Light Co., was elected vice-president, and A. G. Schroeder, Grand Rapids Gas Light Co., was re-elected secretary.

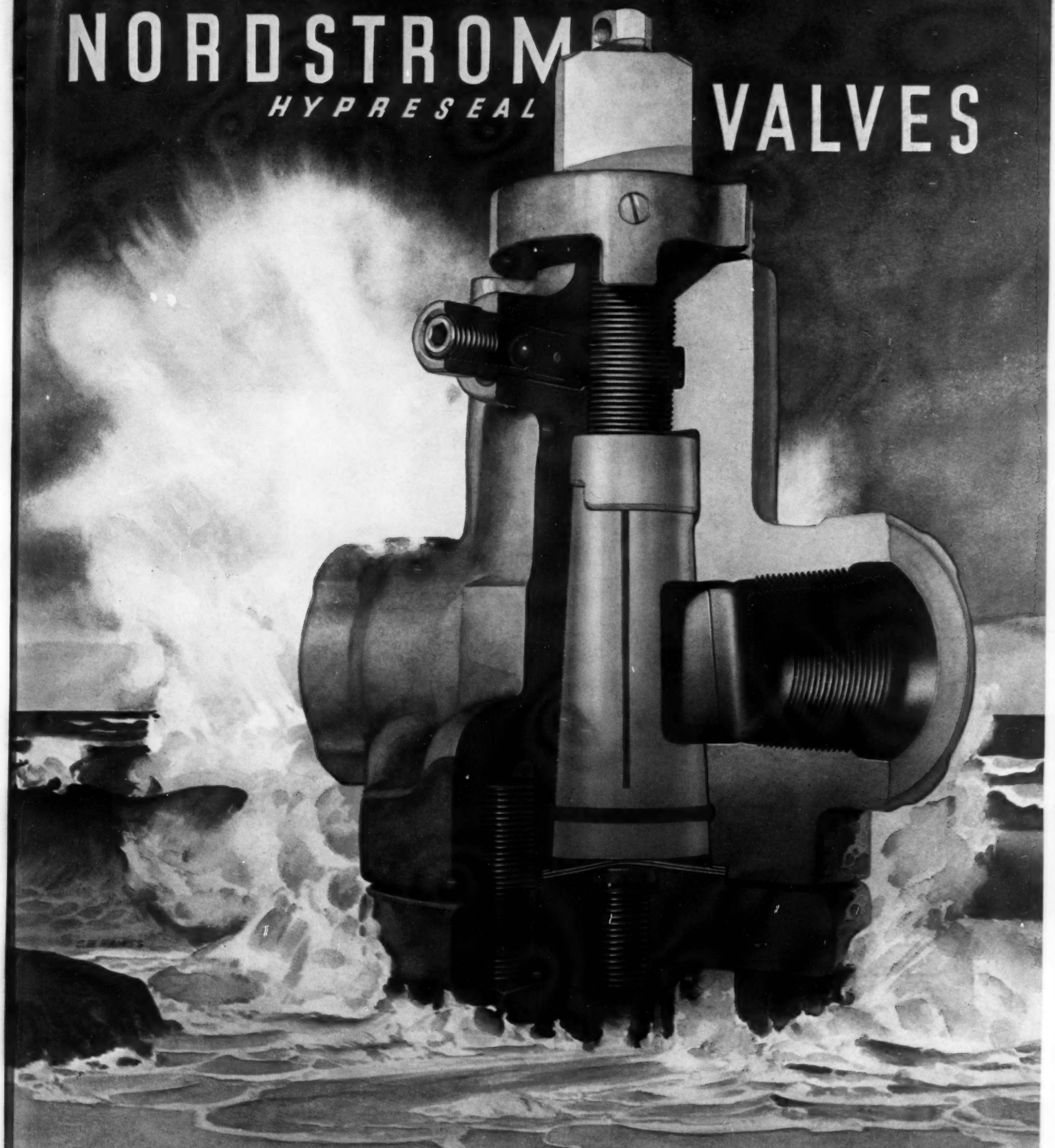
More than 400 men and women were in attendance at the convention, the program of which was carried out as previously announced in GAS. A report on advertising from C. W. Person, director of publicity and advertising of the American Gas Association, read by Secretary Schroeder, was an added feature. The Association voted to continue a fellowship at the University of Michigan.

■ ■

Bakewell a Blaw-Knox Officer

Donald C. Bakewell, who recently became affiliated with the Blaw-Knox Co., has been elected a vice-president.

NORDSTROM HYPRESEAL VALVES



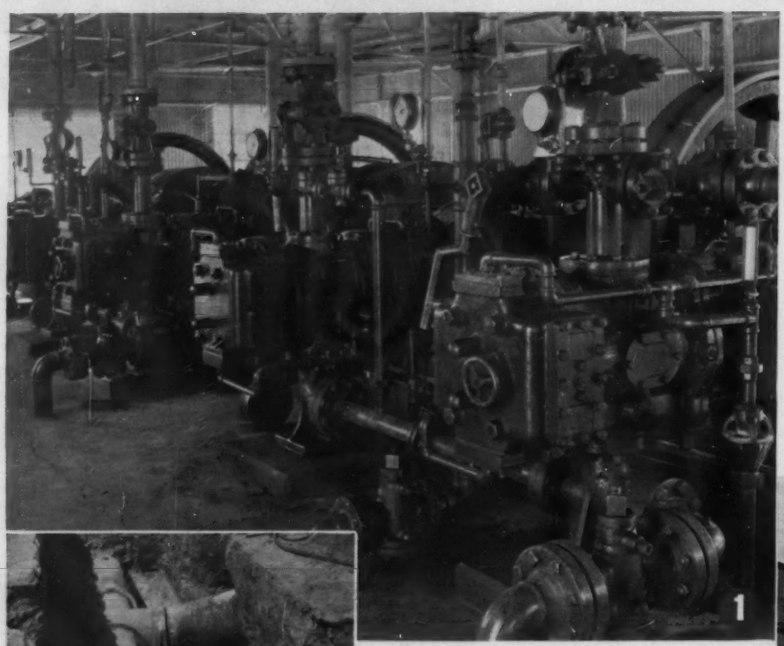
WITH THE CERTAINTY OF THE TIDE

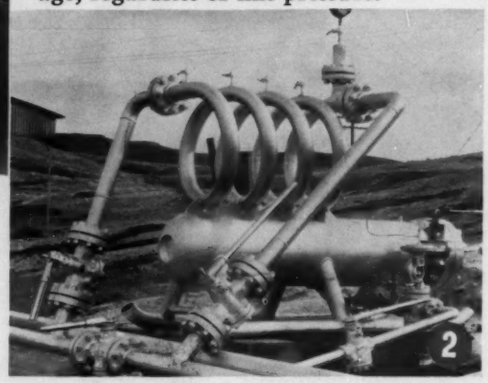
The Nordstrom Hypreseal Valve has already made great strides in handling extreme pressures and temperatures, in the Gas, Petroleum and Chemical Industries. More and more the Hypreseal is becoming the preference; its universal acceptance is a certainty. The impervious seal, in combination with "Sealdport" lubrication, gives to this valve unusual characteristics that guarantee highly satisfactory performance.

THE PERFECT APPLICATION OF A PRINCIPLE

SAFETY
in gas handling *demands* leak-proof valves

Nordstrom Valves are the surest insurance against leaks. Patented "Sealdport" lubrication seals the plug against all leakage, regardless of line pressure.





1. Nordstrom Hypreseal Valves on heavy-duty gas compressors on outlet lines, assure tight seal.
2. Nordstrom Hypreseal Valves on gas-trap.
3. Nordstrom iron valve on low-pressure city distribution line.
4. Nordstrom Valves on large natural gas transmission line.

½" to 30"

(ABOVE) Largest plug valve ever built.

(AT LEFT) Nordstrom Curb and Meter Cock.

MERCO NORDSTROM VALVE CO. *A Subsidiary of* **PITTSBURGH EQUITABLE METER CO.**

Main Offices: Pittsburgh, Pa. *Branch Offices:* New York City, Buffalo, Philadelphia, Columbia, Memphis, Atlanta, Chicago, Kansas City, Tulsa, Houston, Los Angeles, Oakland. *Canadian Representatives and Licensees:* Peacock Brothers, Ltd., University Tower Building, Montreal, Quebec.

NORDSTROM

LUBRICATED PLUG VALVES

PATENTED "SEALDPORT" LUBRICATION

F. M. Brewster Heads Natural Gas Men in Pennsylvania

FRANK M. BREWSTER, president of Belmont Quadrangle Drilling Corp., Bradford, Pa., was elected president of the Pennsylvania Natural Gas Men's Association at the annual meeting, which was held following a golf party and dinner.

W. H. Locke, vice-president of United Natural Gas Co., Oil City, was elected vice-president of the association. B. H. Smyers, Jr., Pittsburgh, was elected secretary-treasurer.

The following were elected to the board of directors:

C. E. Bennett, president, Manufacturers Light & Heat Co., Pittsburgh; H. D. Freeland, Waynesburg; T. B. Gregory, president, Union Heat & Light Co., Emlenton; S. W. Meals, president, Carnegie Natural Gas Co., Pittsburgh; F. R. Phillips, president, Philadelphia Co., Pittsburgh; T. W. Phillips, Jr., president, T. W. Phillips Gas & Oil Co., Butler; S. C. Preston, vice-president, and J. F. Robinson, president, Peoples Natural Gas Co., Pittsburgh; F. F. Schauer, vice-president, Equitable Gas Co., Pittsburgh; George E. Welker, president, United Natural Gas Co., Oil City; George Wittmer, Jr., president, American Natural Gas Co., Pittsburgh.

■ ■

McKana, Statistician, Resigns From Peoples Gas Light

Ralph L. Braucher, for a long period an executive office assistant, The Peoples Gas Light and Coke Co., Chicago, has been appointed statistician to succeed George E. McKana, who resigned because of ill health.

Mr. McKana has been with the company for 18 years. Mr. Braucher joined the staff in 1923 in the accounting department, was later made assistant budget director, and then was promoted to the position he held at the time of his new appointment.

Jacob A. Farber, assistant statistician, will have supervision of operating statistics. Allan J. Good, assistant statistician, will supervise financial statistics. Market statistics will be in charge of George A. Morgan.

■ ■

Gas Exhibits, Inc., Formed to Handle 1939 Fair Display

Gas Exhibits, Inc., has been organized to conduct the gas industries exhibit at the New York World's Fair in 1939. President is H. H. Cuthrell, vice-president of Brooklyn Union Gas Co.; vice-president, W. T. Rasch, president of American Gas Products Corp.; secretary, C. W. Berghorn, executive secretary, Association of Gas Appliance and Equipment Manufacturers; treasurer, N. T. Sellman, vice-president, Consolidated Edison Co.

The gas industries contemplate spending a million dollars in this activity, it is stated.

■ ■

Accounting Changes for N. Y.

Beginning January 1, 1938, gas companies in New York state with revenues exceeding $250,000 a year will follow new accounting procedure as a result of an order of the Public Service Commision. The commission's new accounting systems do not set forth any method for determining depreciation. The commission's 1934 systems prescribed the straight-line method.

■ ■

Report Analyzes Effectiveness Of Bulletin Board

Employee Contact Through the Bulletin Board, a report recently issued by the Policyholders Service Bureau, Metropolitan Life Insurance Co., is available to anyone interested.

Seventy companies contributed information concerning their policies and practices. Eleven companies reported that the responsibility for bulletin board policy and for review of material for posting is assumed by officials of the company. In 12 other cases either the personnel or the safety director is held responsible.

The survey points out one of the most important factors in the effectiveness of a bulletin board is the location. Of the various locations mentioned by companies contributing to the survey one of the most popular seemed to be that in individual departments, generally near a drinking fountain. Such locations, it was pointed out, permit specialized departmental messages when occasion requires.

The report analyzes the nature of the material posted. It also deals with such details as methods of checking effectiveness, number of boards with relation to number of employees, types of board used. Copies of the report may be had by addressing Policyholders Service Bureau, Metropolitan Life Insurance Co., 1 Madison Avenue, New York, N. Y.

■ ■

Coughlin Of Empire Southern Is Transferred East

F. H. Coughlin, vice-president and until July 1, general manager of Empire Southern Gas Co., Fort Worth, Texas, has been transferred to Wilmington, Del., to assume an executive position with the parent organization of the Empire Southern properties.

His promotion has resulted in several other changes in personnel of Empire Southern Gas Co. J. A. Davis, who has been with the company for 12 years, has been named general manager to succeed Mr. Coughlin. Mr. Davis was district manager at Big Spring.

J. P. Kenney, district manager at Brady, for nine years, has been transferred to Big Spring as district manager.

Ernst Tetens, district manager at Gorman for five years, has been promoted to that post at Brady. He will have both Gorman and Brady under his supervision, according to the new arrangement.

■ ■

Gas for Generating Mounts

Consumption of natural gas for generating electricity increased 24.6 per cent in 1936 over 1935, according to a report of the Federal Power Commission. Natural gas used for this purpose amounted to 156,080,000,000 cu. ft.

Fuel oil consumption for generating electricity increased 24 per cent and coal consumption increased 20.7 per cent over 1935.

H. H. DUGDALE

H. H. Dugdale, Vice-President American Gas Products, Dies

H. H. DUGDALE, vice-president in charge of sales, American Gas Products Corp., died on July 19 in Manhattan General Hospital, New York City. He had been ill a short time, but the immediate cause of death was a heart attack. The funeral and burial were in South Bend, Ind., where Mr. Dugdale was born.

Before entering the gas industry, Mr. Dugdale was superintendent of production and afterward sales manager of Briggs & Stratton, a manufacturing firm in the automobile industry.

In 1924 he joined the staff of A. H. Wolff Gas Radiator Co., predecessor of American Gas Products Corp., in Chicago. A short time later he was made assistant sales manager and, finally, sales manager of American Gas Products, a position he held for 10 years. In February, 1936, he was made vice-president in charge of sales.

■ ■

Monongahela Company Names Housing Counselor

A housing counselor has been appointed by the Monongahela West Penn Public Service Co. to work with various agencies in solving housing problems in the company's territory in northern and central West Virginia and Ohio. The appointee is E. E. McWhorter of Fairmont, graduate of West Virginia Wesleyan College and the Harvard School of Business Administration. He will be connected with the company's territorial development department and will assist in promoting the construction and modernization of homes. Several model houses will be erected.

■ ■

Northern Texas Utilities Co. Takes Over Burkburnett Co.

Northern Texas Utilities Co., a unit of the United Gas System, has taken over the physical properties of the Shasta Corp. and the Burkburnett Gas Co., Burkburnett, Texas, and is now operating these properties as part of the Northern Texas Utilities system. According to R. W. Lindsey, district manager for the Northern Texas company at Wichita Falls, the office will be continued at Burkburnett and appliance merchandising will be carried on in cooperation with local dealers.

SALES SLANTS

A month by month presentation of experiences on the sales front.

Manufacturers' Bulletins—Free, Useful Sales Aids

DO YOU allow valuable sales material to go into the waste basket? There's important sales help to be had from the use of manufacturers' sales promotion material, according to a sales manager whose successful experience puts him in a high place. His story follows:

"It would probably be astonishing to some sales managers to know how many dollars, how much time, and how much mental effort goes into the sales material which the manufacturer of the appliance they sell sends them, often without any charge.

"And it has always been astonishing to me to know how little value some sales managers place on it. I include almost all sales promotion material, but I'm thinking particularly of that material known variously as sales kits, demonstration manuals or visual sales manuals because it is designed to help the salesman get results today, not tomorrow.

No person under the sun can be expected to give more thought to why a woman will buy a product than the manufacturer of that product. And no one gives more thought to the matter of developing an effective sales presentation than that manufacturer. It's got to be good if he's going to stay in business and prosper.

"On that point alone don't we owe a little more respect to the sales manuals the manufacturer sends us?

"Selling is not a natural phenomenon like thunder, lightning, or rain. It doesn't just happen. Salesmen need help and the best help they can get. Sales managers who are aware of these facts use the sales manuals sent them and they set the pace for others to follow.

"The sales manual, furnished by almost every appliance manufacturer, has a very definite place in the sales manager's plan of attack. Although his entire sales force are men of long experience, there are times when they can be pulled away from a straightforward, logical, orderly presentation of their story. They often are liable to get first facts last and last facts first. As to the men lacking enough experience to dominate an interview, they also need a manual presentation to help them keep their story orderly.

"Some sales managers I know seem to have the idea that manuals supplied by manufacturers amount to a 'canned presentation' and are not flexible enough to permit his salesmen to meet individual situations. I am sure it is only because such sales managers have never made a serious effort to use them properly.

"A well-designed sales manual, as I find most of them to be, usually has an attractive illustration on each page of the important point made. A headline in large type states that point briefly. If there is smaller type under the illustration and headline, as there usually is, the salesman doesn't have to read it to his prospect. He should learn to tell that part of the story in his own words, enlarging upon it if that proves necessary. The illustrations help to hold the prospect's interest and to clarify the point made.

"The sales manager who teaches his men to use the sales manual can save himself much tedious training work and new men can become producers at an earlier stage because a well-designed sales manual gives them confidence as well as enables them to do a better job."

He Who Sells a Salesman Teaches Salesmanship

"A GOOD salesman never exhausts his chances to learn more and more about his business," said a gas appliance salesman we know. "One simple method I have used with good effect to get a new slant is to study other salesmen in action.

"You get plenty of chances to do this. A salesman is often on the receiving end of selling effort. Besides those things you go out and ask people to sell you—things you use every day—there are occasions when salesmen come to you, asking you to buy.

"Not long ago an insurance salesman called on me. My tendency was to resist his effort. He was, in effect, making a raid on my pocket book and my resistance was one of self-defense. Strangely enough, that's the attitude most people take toward salesmen.

"A lot of insurance salesmen are well trained and know their business. The fact that this particular man was obviously new to selling gave me an opportunity to see where my inexperience might be leading me into pitfalls. When I told him that I didn't need more insurance and made my refusal stick, I later wondered why that defense worked.

As a fair admission, I probably could have used more insurance. This being true, it is obvious that my rebuff was effective because the salesman had not turned to my individual case the knowledge he must have had of my need for what he sold. That I could have used insurance wasn't enough. Before I'd buy I had to need it and need it badly. In that case I would have parted with my hard cash willingly.

"Such experiences have helped me to understand why Mrs. Jones or Mrs. Brown to whom I tried to make a sale did not come across. They are no different from me when I am on the receiving end of selling effort.

"I recall how the insurance salesman pointed out to me that his company was the biggest in the world and he placed great stress upon that fact. Apparently, this was to show

me 'how long the insurance policy would last, how dependable it was.' But this was of no real interest to me, because I had no intention of buying insurance.

"This was comparable to my efforts to sell Mrs. Jones and Mrs. Brown by talking heavy gage steel and lasting qualities when thoughts of buying were farthest from their mind.

"The insurance salesman had been smart enough to find out how much and the kind of insurance I already had. But he didn't make use of that knowledge. Truth is, the policy wasn't adequate, as I later learned from a top-notch insurance salesman, because I had bought it as a single man and it didn't fill the bill for a family man.

"A close study of this experience told me never to miss a chance to make comparisons of new and old equipment. Not to disparage the old equipment, of course, but to show how much better the new equipment is.

"I could point out other parallels but this seems enough to make it clear that you can learn by thinking over the times when you were on the receiving end of selling."

■ ■

Guests Cook at Portland Co.'s Commercial Appliance Show

A vegetable cooker with a capacity of 3½ bushels of potatoes, an oven that holds 48 pies, and an automatic toaster that turns out 320 slices of toast an hour were high lights of a commercial cooking exposition recently conducted in Portland, Ore., by the Portland Gas & Coke Co.

Hotel and restaurant supply dealers and manufacturers co-operated with the gas company to assemble what is believed to be the most complete, if not the largest, display of commercial gas cooking equipment seen in the Pacific Northwest. It was the first of its kind in Portland.

Most of the equipment was available for trial by guests at their leisure. Even the necessary foodstuffs were on hand. A member of the home service bureau of the gas company acted as hostess at each session, while salesmen were in charge of the floor. The informal manner in which the affair was conducted proved very popular with the 200 restaurant operators, chefs, and other guests.

The exposition was open afternoons and evenings with admission by invitations which entitled guests to a copy of a 32-page booklet, "Helpful Hints for Volume Cooking," and also a chance to win a door prize.

■ ■

Wishon Leaves San Joaquin

D. L. Wishon, manager of the Bakersfield, Calif., district for San Joaquin Light and Power Corp., retired on July 1 after serving the company for 35 years. Harold K. Fox, who has been in charge of hydro-electric construction for the company for 13 years, succeeds Mr. Wishon as Bakersfield manager.

Talk—Talk—Prospects Balk

"ALMOST every salesman has an outstanding weakness which he must strive constantly to overcome," said a gas appliance salesman of our acquaintance. "Mine, I believe, is an inclination to talk too much."

I mention it because it is not an exception with me. Many fellows I know have the same failing. And worse still, some of them never realize that they are missing sales because of their tendency to gab.

As you unfold the gas appliance story, the prospect will develop thoughts in his own mind, often in the nature of objections. As long as these objections rest in the prospect's mind, he remains so preoccupied that you might as well tell the rest of your story to a stone wall for all the good it will do.

Some prospects give no indication that they are harboring objections. A salesman who talks too much, never pausing to ask questions in order to draw out these objections, is sunk.

On the other hand, when you do get a prospect who will express his objections voluntarily, you're lucky. But that luck will get you nothing, if you don't listen. In my experience, you are worse off by interrupting a prospect than you could possible be if the prospect simply kept his objections to himself, never trying to express them.

Once you form the habit of being a good listener as well as a good talker, selling becomes more intriguing than you had imagined.

Here is what I mean. I was telling the story of "no moving parts" to a gas refrigerator prospect. He got the idea that it was not possible for a thing to produce power successfully without motion. To me it was a foolish thought, but not to my prospect. And the only reason the thought developed in his mind was because I had failed to explain fully the basic principle of gas refrigeration.

By bringing out this objection, my prospect was simply telling me that my explanation had not been clear. Without being aware of it, he was doing me a favor.

Objections are selling aids disguised. You have everything to gain and nothing to lose when you pull them out of your prospect's mind.

My policy—and I have found it a good one—is: Let your prospect do his share of talking.

LITTLE NAT **By Vance Van Demark**

"He says some people go to the seashore and some to the mountains on their vacations —but he'd rather stay right here in his cool, all-gas kitchen."

A display in a furniture store where gas ranges have become a major department through the company-dealer co-operative program of Houston Natural Gas Co.

Houston Natural's Co-op Plan Boosts Sales

THE Houston Natural Gas System which is made up of four operating companies serving some 20 small cities and towns along the coastal plain of Texas, doesn't believe in selling gas appliances of any kind in competition with the retail dealer. Yet, last year these gas companies, working with range dealers, caused 15 out of every 100 of its domestic customers to purchase new modern gas ranges. The average price of these ranges was in excess of $100.

Frank C. Smith, president and general manager of this system, states the company's policy: "100 per cent co-operation with all gas appliance dealers. Competition with none."

That the policy works exceedingly well for these companies is evidenced not only by the 1936 range sales of 15 sales for every 100 customers, but by the record of previous years on ranges, water heaters, gas refrigerators, and other gas appliances. In 1935, for example, appliance dealers co-operating with these gas companies sold 13 modern gas ranges for every 100 domestic meters; and the year before, which was the first year of this dealer co-operative plan, 7 out of every 100 customers were sold gas ranges.

In the twenty communities this gas system serves there are some 50 range dealers, and 45 of these dealers are today co-operating with the gas companies. They carry ample stocks of the leading makes of ranges. They give the modern gas ranges a preferential position in their store display. Many dealers have outside salesmen specializing on range sales. Hence, in sales-manpower the Houston Natural co-operative program overshadows anything that these gas companies alone could profitably put into the field.

Success of this dealer plan is due largely to the efforts of W. S. Keenan, who has had charge from the beginning.

Starting from scratch without any previous appliance merchandising experience, Mr. Keenan has built up a working partnership with the hardware dealers, furniture merchants, and other range dealers. Today these dealers and this gas system are close business friends. Both the dealers and the gas system have profited.

While range sales are pushed throughout the year, two special merchandising campaigns are launched each year; one in the spring and one in the fall. These special sales drives usually last for thirty days and are based on some special merchandising offer; sometimes an extra old-range trade-in allowance, other times special terms, or some free deal. Always, however, these special offers have a "buy now" appeal with a definite time limit.

Frequently a series of cooking schools or "Home Institutes" are held a few weeks in advance of these special campaigns for the purpose of generating interest in new modern gas ranges.

Company Shares Cost

The Houston Natural Gas System pays a substantial part of the cost of these promotional activities, but the co-operating dealer also shares in their cost.

In the beginning of each year the gas company's official family and the co-operating dealers meet together to review the past year's results and to consider new plans for the current year. Suggestions or criticism from dealers are invited. A schedule of sales activity for the current year is voted on. Dates for each campaign event are adopted. This fixes the work for the year.

The advertising and promotional plans are then formulated, and budgets are set up. Prior to the launching of each campaign, each co-operating dealer receives a prospectus of the campaign, is advised of the total cost, and agrees to pay his share of the cost.

Through sincerity of purpose and with the aid of time, mutual understanding has been established between all parties to such an extent that today campaigns are launched with no more effort than would be required if these gas companies engaged in appliance merchandising for their own account.

■ ■

Pacific Coast Sales Up 29.1%

Domestic gas sales increased 29.1 per cent in May, 1937, over May, 1936, in the Pacific Coast area of California, Arizona, Nevada, Oregon, Washington, and British Columbia, according to statistics released by the American Gas Association. The figure includes sales of gas for house heating. Industrial and commercial sales were up 11.9 per cent.

Revenue for the month rose 14.2 per cent over May, 1936.

■ ■

Gassman Is Superintendent

C. J. Gassman, since 1934 local manager of the Citizens Gas Co., McCook, Neb., has been named district superintendent of the Central States Electric Co.'s gas division, with headquarters at Sterling, Colo. Mr. Gassman will continue to carry the duties of manager at McCook.

This Dealer-Cooperative Campaign SOLD 1,000 AUTOMATIC WATER HEATERS in 30 days!

I'm the dummy!
I FORGOT-
to turn off the old water heater!"
Special Sale
GAS APPLIANCE ASSOCIATION OF SAN DIEGO COUNTY
"Be seeing ya,
I FORGOT-
to turn off the old water heater!"
Spring Special
GAS APPLIANCE ASSOCIATION OF SAN DIEGO COUNTY
"Spanking sea breezes!
I FORGOT-
to turn off the old water heater!"
Spring Special
GAS APPLIANCE ASSOCIATION OF SAN DIEGO COUNTY

Fifty-seven San Diego County dealers in automatic gas water heaters recently sold 524 automatic water heaters in a 30-day campaign period meeting the rigid requirement that each sale must replace an old manually operated heater, be A. G. A. approved and cost in excess of $35.00. The average price paid for each heater was $52.04 with 17 manufacturers represented.

It was reliably estimated that an additional 500 automatic heaters were sold during the same promotional period that did not meet campaign requirements. All sales were stimulated by a generous program of advertising and publicity.

The San Diego Consolidated Gas and Electric Company takes this means of thanking both dealer and manufacturer for such a splendid show of co-operative effort.

SAN DIEGO CONSOLIDATED GAS & ELECTRIC COMPANY

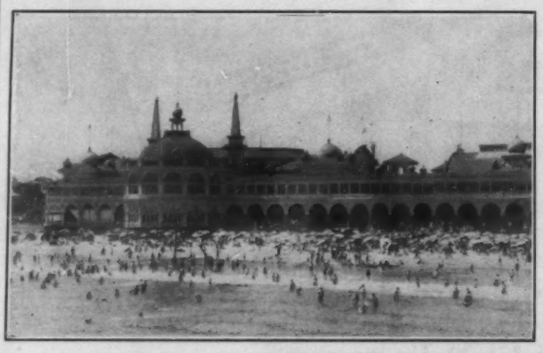
Bureau of Standards Offers Burner Port Depths Paper

IN a paper entitled "Effect of Port depth on Limits of Operation of Domestic Gas Burners" (RP 988), in the National Bureau of Standards *Journal of Research* for April, 1937, John H. Eiseman and Francis A. Smith present the quantitative relationships which have been found to exist between the depths of the ports and the several limits of operation of a domestic gas burner.

The three more important limits in this connection are: (1) Flashback—the traveling of the flame back into the burner casting; (2) blowing—the blowing or lifting of the flames away from the burner ports; and (3) yellow tips—the appearance of a yellow color in the flame caused by too small an amount of air in the mixture of gas and air delivered to the ports. It is desirable to design a burner so that the satisfactory working range between these limits is as great as possible and at the same time to insure the adequate injection of primary air.

The effect of variations in depth of port on the "yellow-tips" limit was found to be negligible. On the flashback and blowing limits it is small, from 1½ inches to ¼ inch, the burner being more susceptible to flash back and a very little more susceptible to lifting as the depth of the port becomes less. The effect is somewhat greater from ¼ inch to 1/16 inch, being roughly equal to that from 1½ inches to ¼ inch. The injection of primary air increases more and more rapidly as the depth of port decreases from 1½ inches to 1/16 inch because of the decreasing resistance to the flow through the ports.

The results obtained with the mixed gas of 600 B.t.u./ft.³ distributed in Washington, D. C., and a natural gas of 1,170 B.t.u., and with ports varying in size over the range usually used with domestic appliances, indicate that a compromise between all the factors involved might result in the selection of a port ¼ inch in depth as the most practicable.



COME TO SANTA CRUZ

NORTHERN CALIFORNIA'S LEADING BEACH and MOUNTAIN RESORT

Plan to include a visit to Santa Cruz, California as a part of your convention itinerary . . . you will be delighted with its fine golf courses, excellent tennis courts, accessibility to the Big Trees, and its many opportunities for sports and recreation of all kinds.

Santa Cruz—Home of the General Offices of

COAST COUNTIES GAS AND ELECTRIC COMPANY

Gas Press Ironer Is Marketed By Meadows Mfg. Co.

THE Meadows gas-heated press ironing machine is a new appliance placed on the market by the Meadows Manufacturing Co., Bloomington, Ill., and now being sold by some of the important mid-west gas companies.

The Meadows press-type ironer uses nothing but gas and has a heating element suitable for any type of gas. The portable ironer weighs 30 pounds and is said to be the lightest domestic ironer ever built.

It consists of a convex padded board and a gas-heated concave "shoe." The operator sits in front of the machine. Finger-tip pressure on a knob brings the shoe in contact with the ironing board. Another knob is pulled toward the operator and—with practically no effort, according to the company—a pressure of from 500 to 600 pounds exerted on the material being ironed. Heavy springs in the base of the ironer allow a certain freedom of movement so that, the manufacturer states, a handkerchief can be ironed at one end and several thicknesses of a sheet or table cloth at the other end at the same time.

Operation cost is said to be less than 1 cent an hour.

The Meadows Manufacturing Co. has issued a salesman's manual describing the features of the ironing machine and the advertising and sales promotion material that is available, defines the market for it, outlines the competition, gives selling points, and shows how to close sales.

■ ■

American Recording Chart Co. Named Anubis Distributor

Appointment of American Recording Chart Co. as distributor of Anubis gravitometers, meters, gas balances and other instruments is announced by George Sydney Binckley, C. E., in whose laboratories the Anubis line has been developed and perfected. According to the manufacturer, the instruments offer unusual accuracy in the measurement and analysis of gas and liquids.

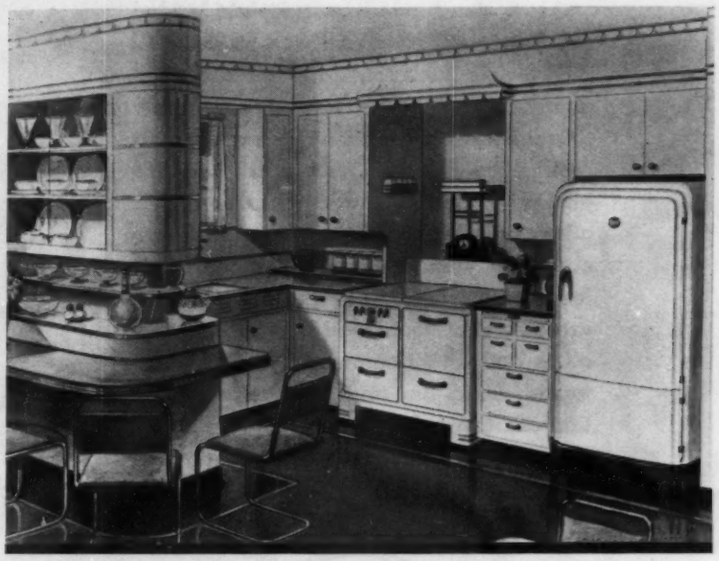
American Recording Chart Co. states that this is the first step of its program to offer to the trade a complete line of such instruments and equipment. Other products offered by the company are the Arcco recording charts, Arcco ink and Beta fountain pens.

Information and specifications can be secured from American Recording Chart Co., 428 Boyd Street, Los Angeles, Calif.

INTO THE DEALERS' "NET" GO MORE GAS APPLIANCE SALES

★

Gas appliance sales in Southern California continue to soar upward . . . thanks to progressive and up-looking manufacturers whose products aim at, and reach, new standards of design and convenience of operation.



All-gas kitchens lead to all-gas homes heated with modern gas furnaces. Above is one of our recently designed gas kitchens . . . the last word in modernity, beauty, successful gas cookery, refrigeration and hot water service.

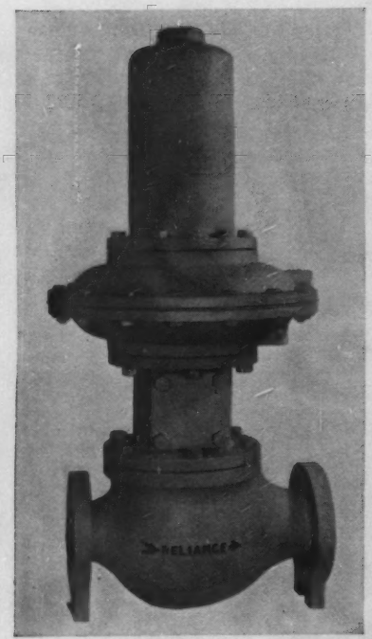
★

SOUTHERN CALIFORNIA GAS COMPANY

SOUTHERN COUNTIES GAS COMPANY

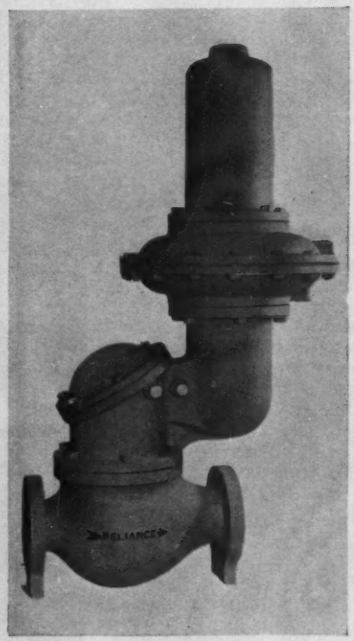
Los Angeles, California

A NEW COMBINATION BALANCED VALVE REGULATOR



CBV Direct connected

These gas regulators have been newly designed throughout for the purpose of providing the advantages of interchangeability of parts, unit construction, reduced internal motion and friction, greater accuracy in control and maximum flow capacity. They are now available in a full range of sizes from 2 inch to 10 inch, and in spring loaded, lever weight loaded, dead weight loaded and pilot models. As reducing or back pressure regulators, they afford many combinations in assembly. Change from high to low pressure service is easily effected. A special stabilizer eliminates surging and pulsation. The offset types have a forged rocker arm equipped with oilite bearings and stainless steel rollers. All diaphragm heads are interchangeable on any size of both offset and direct connected high pressure types. Long life and satisfactory operation are insured by precision construction and the use of the best materials for each part.



CBV Offset connected

REGULATORS YOU CAN RELY ON — RELIANCE — SINCE 1910 — TRADE MARK

RELIANCE REGULATOR CORPORATION

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RELIANCE REGULATORS

PILOT TESTING vs. FOUR-POINTING

By HARRY A. FAULL

Southern Counties Gas Company*

WHETHER to four-point a repaired meter, pilot test it, or do both, is a point on which there is a variety of practices among Pacific Coast gas companies. The purpose in making either test is to disclose the existence of leaks within the meter that would not be evident in a submersion leak test, and that would, on very low rates of flow such as that equal to the consumption of one or two pilot lights, render the meter non-recording or very much in error in the slow direction.

H. A. FAULL

The difference between tests, in the last analysis, is that the four-point test discloses the leak itself, while the pilot test shows the amount of error introduced by the leak. In addition, the pilot test will show up a meter that has its stuffing boxes packed too tightly or has other mechanical binds; these conditions will not be revealed by the four-point test.

The tests, while closely related, are very dissimilar physically. Following is a brief description of each test.

Four-Point Test—Tin Meters

With the top removed, the inlet of the meter is connected to a source of gas supplied at a pressure of about four inches of water column, and a burner cock is connected to the meter outlet. A cock in the supply line is then opened, and, after the tangent has moved through a complete revolution, the gas escaping from the burner cock at the meter outlet is ignited. The flag arms are then removed from the tangent wrist and the tangent is pointed toward the front left-hand corner of the meter. Each flag arm will move to the end of its stroke, and, if there are no leaks in the meter, the flame at the meter outlet will burn down and go completely out.

The tangent is then pointed toward the rear right-hand corner of the meter and the test repeated as before. It is necessary to test the meter with the tangent in these two positions in order to test the front and back of the inlet and outlet channels; leaks in any other part of the meter would cause no extinguishment of the test flame with the tangent in either position, front left or right rear.

The above tests are known as "quartering," and, if the test flame does not go out on either of them, an internal leak is indicated and further tests are made with the tangent pointing in the following directions: toward the inlet tube, toward the back of the meter, toward the outlet tube, and toward the front of the meter. Tests with the tangent in these four positions are known as "Four-Pointing" tests and their purpose is to locate the leak. By means of the four-pointing tests, the operator can determine if the leak is in the front or back of the meter, excluding valve or table leaks, which will show up at any tangent position.

A variation of this procedure is to use air as a testing medium, and, after the flag arms have moved to the end of their strokes, the air supply valve is closed and a manometer, connected between the supply valve and the meter, is observed; a drop in the manometer reading indicates a leak. Each method, gas and air, has its proponents and a choice between the two seems to be a matter of individual preference.

Iron Meters

The four-point test, as just described, is applicable only to a tin meter, or a meter in which the valves are enclosed and the tangent and flag arms are exposed. When the four-point test is applied to an iron, or open top, meter, the inlet air is introduced through the meter outlet with the meter top removed. This means that the pressure of the testing air is under the valve cover tending to lift it from its seat, a condition that limits the amount of air pressure that can be used in the test to a very low value. Obviously, the use of gas and a test flame is not feasible when four-pointing meters through the meter outlet.

Due to the construction of these meters, which does not permit a ready disengagement of diaphragm stroke from valve mechanism, it is necessary, when four-point testing them, to stop the valve by hand at the cut-off position and hold it in this position for the test; this application of pressure to the top of the valve cover is quite unlike any condition that would be encountered in service. The pressure on top of the cover in service would be the differential pressure across the valve, which, at 0.5 in. W.C. differential would be equivalent to a dead weight of less than 0.2 lb. on a No. 1A Sprague valve cover, while the dead weight required to keep the same valve cover from turning with a pressure of 1.0 in. W.C. against the diaphragm is 3.75 lbs. This added weight, of course, makes for a tighter seal between valve seat and cover.

The San Diego Consolidated Gas and Electric Co. several years ago developed special equipment for apply-

* To be presented before the Technical Section of the Pacific Coast Gas Association at the annual convention, August 17-19, 1937, at Seattle, Wash.

ing the four-point test to iron meters. Essentially, it is the same test as just described, except that a test meter, with a special test hand driven directly by the tangent with no gear reduction, is used instead of a manometer to check for a leak. The test meter is connected in tandem with the meter under test and any movement of the special test hand on the test meter, while the valve in the meter under test is held in a cut-off position, indicates a leak. This equipment has proved very satisfactory for several years, and a detailed description of it may be found in Pacific Coast Gas Association *Proceedings*, 1930. (Vol. 21, p. 464).

Pilot Test

The pilot test, as conducted by one company in Southern California, consists of connecting in series, inlet to outlet, 36 five-light meters with a wet test meter ahead of the series and a regulator ahead of the wet meter set to a delivery pressure of 8.0 in. W.C. The outlet of the last meter in the series is connected to a regulator set to hold a constant pressure of 2.0 in. W. C. against a small fixed orifice which limits the flow through the series to one cu. ft. per hour. A small error is introduced in that the successive small pressure losses across each meter cause a total difference in pressure between the test meter and the last meter in the series of about 4.0 in. W.C. (this for 36 5-lt. tin meters). Thus, if the last meter in the series is actually 0.0 at the pilot rate, it should test about 1.0 per cent fast when referred to the test meter. This error is disregarded unless the meter is just over the borderline of the limits of accuracy established for this test; the limits of accuracy are 5.0 per cent fast to 5.0 per cent slow. If a meter fails to pass the pilot test, it is then four-pointed to determine the approximate location of the internal leak that is causing the D.R. or the slow proof. If the meter four-points successfully but is slow on the pilot test, it may be concluded that the slow proof is caused by mechanical binds in the meter, which, as previously mentioned, the four-point test does not disclose.

Another form of the pilot test, used by another Southern California company, is to pass gas through the meter at a rate of ½ cu. ft. per hour for 20 minutes and observe the movement of the meter test hand. If the test hand moves through approximately one division of the two-foot proving circle, the meter is considered o.k. This method of testing requires less attention than the method previously described, and is, therefore, faster. It is somewhat less accurate than the first method, but considered accurate enough by the company using it. The pilot test, in either form, can be applied to either tin or iron meters with the same equipment and in the same manner.

A summation of both the four-point test and the pilot test shows advantages and disadvantages in each with respect to the other. The four-point test is faster than the pilot test and requires much less shop space.

In the four-pointing of tin meters, the partitions, channels, diaphragms, and valves are tested at a pressure of 4.0 in. W.C. This is considerably more differential pressure than these parts will be subjected to in service, which fact may be considered desirable as providing a factor of safety. On the other hand, it may be considered unnecessarily severe.

In four-pointing iron meters, there is the extraneous condition of pressure under the valve cover, in the case of meters on which flag arms can be readily removed from the tangent wrist, and the condition of greatly increased pressure on top of the valve cover in the case of this type of meter. Whereas, the pilot test, as applied to all types of meters, is practically an exact simulation of conditions under which the meter will be called upon to measure gas in service.

Mechanical binds in a meter will not be disclosed by the four-point test, but will show a very slow meter at the pilot rate.

Which test to apply to repaired meters is dependent, in a measure, on local shop conditions. If shop space is at a premium, and if it is known that meter repairmen will not leave mechanical binds in meters, then the four-point test is undoubtedly the one to apply.

Meters are called upon to measure gas at three rates of flow, roughly speaking: the full open rate, the check rate, and the pilot rate, the latter rate constantly becoming more important. A logical line of reasoning would probably conclude therefore that the meter should be proved at these three rates of flow. If this conclusion is correct, the pilot test, supplementing the open test and the check test, is the one to apply.

Williams Discusses Double Orifice Meter Tests at S. C. M. A. Meeting

"REVIEW of tests made with meters using a double orifice with reference to the accuracy of the coefficient for low Reynolds number" was the title of the paper presented by B. G. Williams, gas measurement engineer of the Southern California Gas Co., at the regular monthly meeting of the Southern California Meter Association. J. B. Taylor, Jr., of the Signal Oil Co., newly elected president of the association, officiated at the meeting which was held July 22 in Huntington Park.

Mr. Williams' discussion, which was illustrated with slides and provoked much discussion, dealt with recent experiments in the United States and Germany on gas measurement with orifice plates and nozzles.

Entertainment feature of the evening was a sound motion picture depicting the construction of the San Francisco-Oakland Bay bridge. The film was presented through the courtesy of the Columbia Steel Co., under the direction of J. B. Eberhart. Musical entertainment during the evening was provided by Homer Smith, well known radio pianist.

Announced at the meeting was the 1937 edition of the S. C. M. A. Handbook, containing data on the measurement of air, gas, oil and water streams based on latest American Gas Asociation reports on orifice measurement and on C. N. G. A. bulletin TS 353. Also announced was the handbook of natural gas measurement data based on A. G. A. Gas Measurement Committee Report No. 2.

Prices of the books to S. C. M. A. members are $2.50 and $.50 respectively; to non-members, $3.00 and $1.00 respectively. Copies may be secured through James Dunn, 428 Boyd Street, Los Angeles, Calif.

■ ■

Gasoline Plant for Rancho Co.

Construction of a modern high pressure gasoline plant has been started for the Rancho Gasoline Corp. of Los Angeles, Calif., according to announcement by R. E. Bering, president. The new plant is being built on the Reserve Oil Co. lease on the Tejon ranch located about five miles north of Grapevine on the Ridge route. According to present plans, the new plant will be completed and in operation within 90 days. Parkhill-Wade, Inc., of Los Angeles is in charge of engineering and construction.

Reporting Meter Statistics

● **ON THIS PAGE are presented portions of two papers by H. S. HARRIS, Engineer, Southern California Gas Co., Los Angeles, Calif. Published above are excerpts from a paper, "Proposed Method for Reporting Meter Statistics:" below appear pertinent data from a paper, "Do We Buy Gas Meters on Price?" Both papers are to be presented before the Technical Section at the Annual Convention of the Pacific Coast Gas Association at Seattle, Wash., Aug. 17-19.—(Abstracts by GAS).**

THE Committee has found certain discrepancies among the various companies on the Pacific Coast with respect to their method for reporting meter statistics, and after making a survey of the various practices is proposing the following recommendations based on the opinions of the majority of the companies involved.

H. S. HARRIS

In order to determine the year of a meter removed from service, consider the year in which the meter was set, with no regard to the date of repair; in other words, a meter set in 1936 and removed in 1936 would be a "less than one-year meter." But where it might have been set in December, 1936, and removed in January, 1937, it should be considered as a "one-year meter." A meter repaired in December, 1936, but not set until 1937 should be considered as a 1937 meter.

Inasmuch as the percentage of D.R. meters as now reported by all companies is affected by the number of meters removed for test, these meters should not be included in the summation of the total accuracy; in other words, the total percentage *slow, fast* and *correct* meters should add up to 100 per cent.

Meters which have been set on a consumer's premise and found to be not passing gas or not registering, either at the time of the meter installation or any time thereafter; and from an external appearance not damaged to the extent of affecting a test or not reported to have been damaged; or in the event of an internal inspection before leaving the prover room not disclosed as having been tampered with: should be classified as a "don't register," and subcaptioned "pass gas" or "don't pass gas," and these meters may be shown if desired on the monthly reports but only by the number of meters and not as a percentage. In the annual reports they should be shown grouped as to years of service and as a percentage not of the meters tested but of the number of meters in service for each respective year.

Meters which have not been set on a consumer's premise but returned to the Meter Shop on account of having been dropped from a truck, in an accident, etc., should be classified as "returned meters" and should only be shown by the number of meters and not as a percentage.

Meters which have been set on a consumer's premise regardless of the length of time, and visually damaged due to an accident, mischievously or deliberately tampered, etc., should be classified as "no test" and should be only shown by the number of meters and not as a percentage.

With respect to O. K. meters, from a standpoint of the company's revenue it seems advisable that there should be a further division in the legally correct group, which now has a spread of 4 per cent, ranging from minus 2 to plus 2 per cent. It is suggested that these O. K. or legally correct meters be divided between minus 2 per cent and 0.0, and 0.0 to plus 2 per cent. The meters testing O. K. may be equally divided into both groups.

Gas Company Meter Tests

TESTS were conducted to determine whether or not the meter was correctly designed from a structural strength standpoint as to deflections and distortions, and from a mechanical standpoint as to correct tolerances in the various loose connections. In addition a study was made of the effect of increased pressure on changing the volume of gas enclosed by the leather diaphragm.

The first two items were determined by means of micrometers inserted through the case of the meter connected through a vacuum tube microammeter which contacted the diaphragm disc at the end of each stroke, the stroke being measured by adjustments on the micrometers, three of which were used in order to define the plane of the diaphragm disc.

In the two types of meters most commonly used on the Pacific Coast, it was found that a definite relationship existed between increased flows through the meter (equivalent to increased differentials) and the stroke of the diaphragm, and that the stroke changed to such a large extent, in some cases 5 to 6 per cent by volume, that there existed a considerable unbalance between the theoretically correct timing of the valve and the practical timing necessary to have the check and open test at the same proof.

Tests with increased friction on the stuffing boxes and with grease on the valves showed increased slowing down in proof which could not be reconciled to changes in the stroke of the diaphragm. This sugested a further test to determine to what extent the volume surrounded by the leather in the diaphragm would change with increased differential. This test showed changes sufficiently large in volume to warrant the belief that the German meter which has positive stops on the diaphragm leather may have considerable merit. The tests also indicated that the self-adjusting stuffing boxes used in the past few years by one of the ironcase gas meter manufacturers, and now adopted by one of the tinned steelcase gas meter manufacturers, is of some benefit.

An engineer of one of the major meter companies has developed a method of checking the relationship of timing to diaphragm stroke by the use of an engine chart. His method is to connect the diaphragm disc by means of a rod through a stuffing box to a pressure chamber having a pressure equivalent to that inside the meter. This in turn is connected to a pressure element, which by means of a pen transfers to a chart the length of stroke and the differential pressure necessary to operate the meter. Charts developed by him correspond remarkably well to the data obtained by the writer in the test described in the foregoing paragraphs.

It must be admitted that present-day gas meters are perfected to a remarkably high degree for a measuring instrument costing so little. The

ART CONCRETE
Sectional Meter Boxes
AFFORD
Complete Protection for CURB METERS

• *Used by leading gas distributors*

Furnished in combinations suitable for single and multiple set-ups, high and low pressure. **Two star features: 1—Boxes may be lengthened without removal. 2—Knockouts for pipe connections and break-away pipe slots and grooves . . .** Also round curb boxes in varying depths.

Originators and Manufacturers

ART CONCRETE WORKS
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Birmingham, Ala., and Jacksonville, Fla.

writer can only suggest that there are a few parts in the meter which could be strengthened; that there could be some improvement in stuffing box design and possibly slightly closer fits in the bearings, in order to produce a meter which would better hold its proof. By the adoption of some type of positive stops on the leather diaphragm it might be possible to produce a meter which could not exceed present legal limits of proof except in the cases of diaphragm perforation.

■ ■

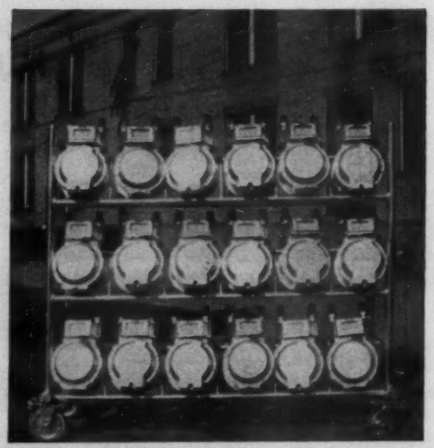
Westoak Builds 11-Mile Line From Erick Field

The Westoak Gasoline Co., Sayre, Okla., has started construction of an 11-mile 10¾-in. O. D. high pressure gas line, according to W. F. Seeger, of the company. The line will supply Westoak's natural gasoline and carbon black operations with part of their requirements from the Erick field and act as a supply line to the Central States Gas Co.

■ ■

Richfield Polymerization Plant

A polymerization plant with a daily capacity of approximately 6,000,000 cu. ft. of gas will be built by Richfield Oil Corp. as part of a $5,000,000 refinery to be erected at Watson, Calif. Through the polymerization process the company plans to produce from waste gases an unusually high octane gasoline.



This useful meter rack, designed by C. J. Burke and D. C. Givens of Texas Cities Gas Co., has a capacity of 36 meters. It is mounted on rubber-tired, ball-bearing rollers.

Texas Cities Co. Meter Men Design Useful Rack

TO speed up work of handling meters at the Waco distribution plant of Texas Cities Gas Co., special features have been designed for a meter rack by C. J. Burke, superintendent of the plant, and D. C. Givens, meter shop foreman. With 18 meters on each side, the rack will allow 36 meters to be pushed about the shop easily by one man, eliminating much extra work involved in handling meters one at a time.

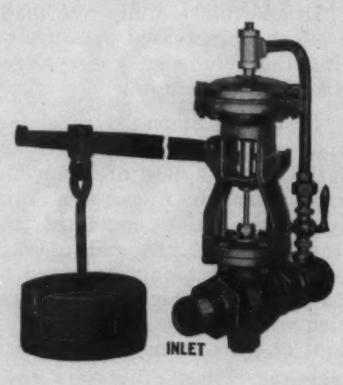
The meters are received on the rack from trucks which have picked them up at customers' premises, and are carted into the prover room. They then find their way around through various parts of the meter shop for necessary repairs, and end up in being rolled into the paint room for a final coat of aluminum paint.

The rack stands five feet from the floor to the top, and is 19½ inches wide and 65 inches long. To insure easy control, the rack was mounted on two rigid casters and two swivel casters.

The four upright ends shown in the accompanying picture are made of 1¼-in. pipe and are 50 in. from the base of the frame to the top. Two cross pieces at the bottom, 22½ in. wide, which form the foundation of the frame, are made of 2-in. pipe. Welded to this pipe are four steel plates which have been bored for nuts and bolts to attach the casters to the frame, and the entire frame is welded.

For supports between the meters Number 24 Oxweld rods are used, set 10½ in. apart, which is sufficient clearance to handle No. 0 Emco meters, No. 5-B Metric meters, and No. 1 Pittsburgh meters. The clear-

For
OIL
and
GAS
under High Pressure



You can handle pressures up to two thousand pounds under perfect control and pass on to your distributing lines whatever reduced pressure may be called for by use of the proper C-F Regulators. There are standard regulators for all pressures up to 600 pounds—for higher pressures designs are adapted to suit specifications.

THE CHAPLIN-FULTON MFG. COMPANY
28-40 Penn Avenue **Pittsburgh, Pa.**

WESTCOTT & GREIS, INC.
Sales and Service
Dallas—Tulsa

REPRESENTATIVES:
Or Any Jobber

HIMELBLAU, BYFIELD & CO.
36 S. Throop St.,
Chicago, Ill.

ance between the outside rails, which are made of one-inch pipe, is 17¼ in., which allows sufficient space to place the meters on the rack without hindrance. The inside braces running crosswise with the frame are made of ¾-in. pipe.

■ ■

Public Service Co. Meter Men Carry Dog-Bite Antiseptic

To safeguard its meter readers against the frequent danger of rabies from dog bite, the Public Service Co. of Northern Illinois, Chicago, has developed a new pocket-size antiseptic.

This antiseptic, selected from a number tested because its formaldehyde content proved most effective in rabies prevention work, is contained in a heavy glass vial encased in a metal box. It is designed to be applied to the wound as soon as possible after the bite.

Harry M. Brown, meter supervisor, and Dr. Hart E. Fisher, chief surgeon, both of the Public Service company, co-operated in planning the packet. They point out that the antiseptic is purely a first-aid precaution. The user must report to a doctor within four hours of its application for further medical attention.

■ ■

Ben Boalt Joins Perfex Corp. As A Vice-President

Perfex Corp., manufacturers of automatic controls, announce through President Luthe that Ben L. Boalt has joined the organization as a vice-president.

Mr. Boalt has been with the heating and refrigeration industries since 1921 when he was the secretary and a director of the old Minneapolis Heat Regulator Co. He continued in these capacities when Minneapolis-Honeywell Regulator Co. was formed. When the Time-O-Stat Controls Co. was acquired, he was made manager of the plant at Elkhart, Ind. Since 1931 until the present, Mr. Boalt has been a director and vice-president of Penn Electric Switch Co.

Mr. Boalt's office will be at the company's home office, 415 W. Oklahoma Place, Milwaukee, Wis.

■ ■

Sprague Co. Elects Fairchild

At a director's meeting of Sprague Meter Co. held July 21, Leslie Fairchild, assistant general manager, was elected vice-president by the board. Mr. Fairchild has been affiliated with the company for the past 24 years.

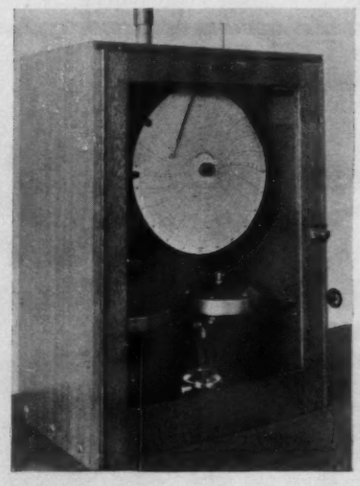
■ ■

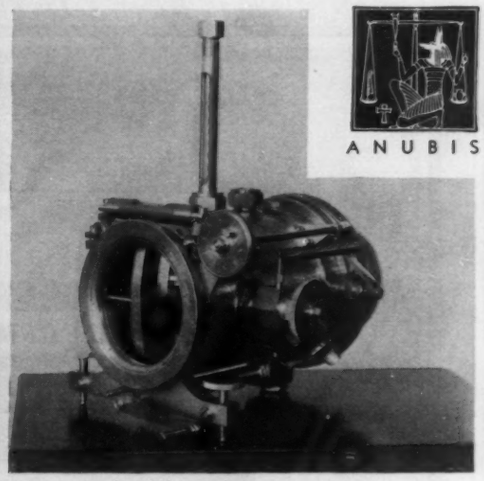
Donaldson Joins Stove Co.

O. T. Donaldson, formerly sales supervisor for United Gas Public Service Co. of Houston, has joined the sales organization of Detroit-Michigan Stove Co. He will be associated with the Dallas office of the company managed by Jack Little.

Announcing...

the appointment of AMERICAN RECORDING CHART CO. as distributors of the complete line of ANUBIS Gravitometers, Meters, Gas Balances and other equipment for the measurement and analysis of gas and liquids; all as produced in the Laboratories of George Sydney Binckley, C. E., of Los Angeles, California.

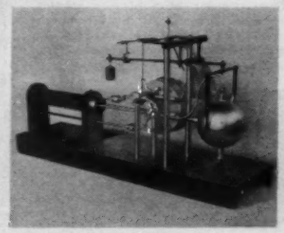




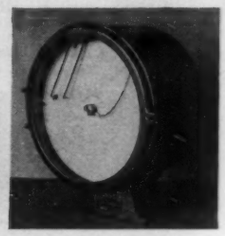
ANUBIS

Anubis Recording Gas Gravitometer complete in case.

Anubis Portable Gas Balance.



Anubis Recording Liquid Gravitometer, with case removed (right).

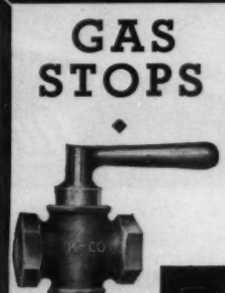


Anubis Meter for gases and liquids (left).

We solicit your inquiries and orders for the ANUBIS Line of Instruments, as well as for ARCCO Recording Charts, ARCCO Ink and Beta Fountain Pens.

AMERICAN RECORDING CHART CO.
428 Boyd Street, Los Angeles, California, U. S. A.

GAS STOPS



G-207 Solid Lever Standard Gas Stop

G-491—High Pressure Roundway Gas Main Stop Male and Female

"by Kitson"
Surest Guarantee of Quality for Forty Years!

KITSON COMPANY
2409-15 Westmoreland St. Philadelphia, Pa.

Kitson Safety Devices (Lovekin Patents) for Domestic Water Heaters	Quality Brass Goods for Gas, Water and All Plumbing Uses

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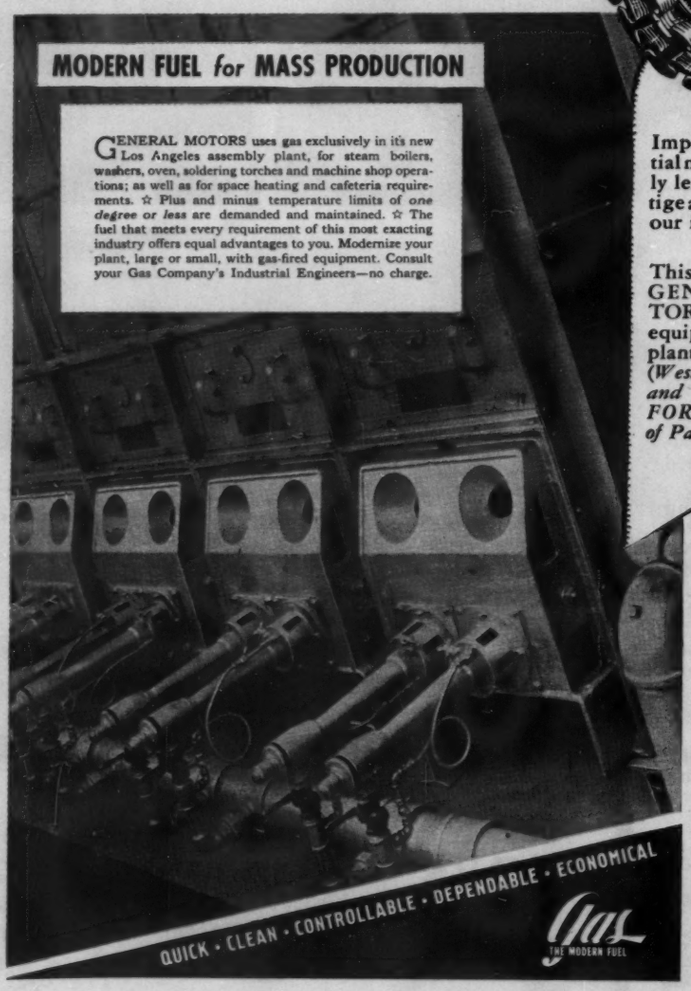
CLIFFORD JOHNSTONE Managing Director Pacific Coast Gas Association

BIG NAMES


MODERN FUEL for MASS PRODUCTION
GENERAL MOTORS uses gas exclusively in its new Los Angeles assembly plant, for steam boilers, washers, oven, soldering torches and machine shop operations; as well as for space heating and cafeteria requirements. ☆ Plus and minus temperature limits of one degree or less are demanded and maintained. ☆ The fuel that meets every requirement of this most exacting industry offers equal advantages to you. Modernize your plant, large or small, with gas-fired equipment. Consult your Gas Company's Industrial Engineers—no charge.
QUICK • CLEAN • CONTROLLABLE • DEPENDABLE • ECONOMICAL
Gas
THE MODERN FUEL

Important, influential names frequently lend their prestige and authority to our industrial ads.

☆

This one features GENERAL MOTORS and its gas-equipped assembly plant, Los Angeles. (*Western Machinery and Steel; CALIFORNIA — Mag. of Pacific Business.*)

BUTANE-PROPANE NEWS

An Outline of Philgas Department's Sales and Advertising Program

By M. W. WELTY
Philgas Department
Phillips Petroleum Company

THE Retail Division of Philgas Department of Phillips Petroleum Co., marketing propane in many districts east of the Mississippi and along the Atlantic seaboard, has launched for 1937 the most extensive and intensive selling program in its history.

Entering its second decade as a bottled gas marketer, Philgas Department is today strongly pushing, along with its new customer sales efforts, the "All-Gas" home idea.

One of the new advertising materials offered, on a cooperative basis, by the company to its authorized appliance dealers in 1937, is a series of five different animated window or floor displays.

The first of the displays features instant heat at the turn of the valve —a striking demonstration of the speed of gas cooking and the instant availability of its full cooking power.

Philgas Department's...
A Turn of the Valve . . .

The three movements in this display are produced from one driving shaft of the motor unit. The cutout word "heat" shows a shimmering background of heat waves throughout the entire action movement. As the hand turns the valve on the stove, the thermometer indicates a rapid rise in temperature—emphasizing the message "full heat instantly."

Each of the five displays in the series to be produced by Philgas will be actuated by the same motor unit. The unit consists of a small brushless electric motor, mounted in a wooden box, driving a series of two rubber-tired wheels mounted on shafts which turn in opposite directions and at different speeds. Any number of actions can be produced by hooking cams, arms, or eccentrics to either one or both of these shafts.

Philgas officials report that the display has been enthusiastically received by dealers and that numerous instances of the effectiveness of the display have been called to their attention by prospective Philgas users and dealers.

The outstanding features of Philgas' 1937 merchandising program are:

1. A complete line of specially-built, special-tested and Philgas and American Gas Association approved propane ranges. This line carries the Philgas trademark, includes models from $59.50 to $164.50, and is warehoused at local Philgas stations. Wherever possible, all range sales are routed through, and sold by, authorized dealers.

2. (a) A retail finance plan applicable to all appliances purchased by authorized dealers from Philgas Department. This plan equals in liberality of terms practically any appliance financing plan today available to the public. Longer, easier terms offer inducement for the purchase of additional appliances such as water heaters and refrigerators, along with the purchase of ranges.

(b) A floor plan which enables authorized dealers to display a complete line of Philgas ranges, refrigerators and water heaters with only a small amount of dealer capital tied up in display stock.

3. A 30-day free trial on several models of Philgas ranges.

4. (a) A simplified rate schedule reducing the cost of gas for all customers using an average, or above average, amount of gas for cooking.

(b) A new "Gas-Home" schedule which further reduces the per decitherm cost of gas when a customer uses a gas refrigerator or water heater in addition to the cooking appliance.

(Turn to Page 82)

...Animated Display
. . . And Instant Heat

Just the propane cylinder valve you have been looking for . . . combines the famous Kerotest Forged Brass Diaphragm Packless valve design with a spring safety device which automatically relieves *only* the excess pressure that may build up in a propane cylinder. Furnished with or without operating handwheel. Listed as standard by Underwriter's Laboratories.

KEROTEST MANUFACTURING CO.
PITTSBURGH, PA.

(c) A further lowered commercial rate.

To back up these "sales levers" Philgas Department is employing many forms of advertising, including 24-sheet posters; full-color hand-out literature; direct mailings to prospects and present users selling "additional appliances" or new appliances to known users of obsolete equipment; window displays, including a new animated unit; neon signs; newspaper advertising; special literature for architects and builders; "additional appliance" and "modernization" promotion through a monthly customer-publication with timely information and appeal.

In addition to this sales and advertising program, Philgas Department will employ special limited-time sales drives, during which time further incentives will be employed to induce prospects to buy, and to reward dealers and salesmen for outstanding sales results.

■ ■

Western Natural Lays Lines

Western Natural Gas Co., Eureka, Kan., is laying 40,000 ft. of new pipe lines to connect with trunk lines and is replacing 45,000 feet of mains and laterals in Eureka with new pipe, according to press dispatches quoting L. M. Mehl, local manager.

The SUPPLEMENT to the Handbook Butane-Propane Gases (2nd edition)..

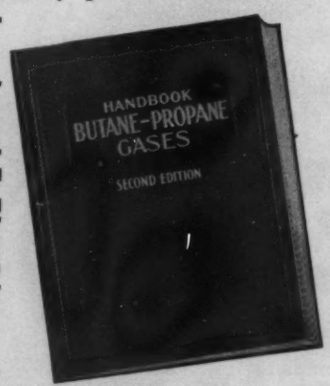
$1.00 Per Copy

A record of the past two years of progress in the *Liquefied Petroleum Gas Industry* published March 1937

HANDBOOK
BUTANE
PROPANE
GASES

SECOND EDITION
375 pages

$5.00 per copy, plus postage



CONTENTS: Use in internal combustion engines: Design & Installation of Storage: Supply from Petroleum Refineries: Engineering Data on the Lower Olefins: Domestic Appliance Testing and Utilization: Economical Comparisons with Coal, Oil, Electricity, Producer Gas, Manufactured Gas: Town Plants: Manufacture from Natural Gas: Special Uses: Volume Correction Factors: Supplements & Revisions: Transportation: Use with other Gases: Analysis & Testing: Properties of Mixtures: Bottled Gas Distribution: Bibliography: Central Plant Directory: Catalogue Section.

2nd Edition Handbook...$5.00
2nd Edition Supplement..$1.00
BOTH NOW $5.00 plus postage

We pay the postage on orders accompanied by remittance.

Published by publishers of OIL & GAS Equipment Review

GAS

The NATURAL Gas Magazine

810 S. Spring St.
Los Angeles, Calif.

Ford Butane Plant Used for Emergency, Peak Loads

A BUTANE gas installation at the Rouge plant of the Ford Motor Co. is maintained to meet peak loads and to serve as emergency and standby supply.

The station is equipped to gassify as much as 200,000 cu. ft. of butane per hour. There are six tanks holding the liquefied hydrocarbon, each of them yielding 900,000 cu. ft. of gaseous butane, and three steam-tube vaporizers.

Butane gas manufacture at the Rouge plant may be carried on either with blast-furnace gas or air as a diluent. In both cases, the liquefied butane is vaporized and fed at several pounds pressure into mixing units. When the butane is mixed with the air, the gaseous butane itself supplies the power for the mixer mechanism. This is accomplished by a direct chain drive between a small Connersville compressor and a large unit of the same positive-displacement type.

The butane gas, under pressure, drives the small unit and the small unit in turn motivates the larger one, which takes up air for the mixture. Air intake is fixed to insure proper proportion, and the mixing operation halts when the pressure on the butane vapor line fails, thus providing a safeguard against production of a butane-air mixture within explosive limits.

When butane vapor is mixed with blast-furnace gas there is no corresponding danger of formation of an explosive mixture. Therefore the normal type double butterfly valve suffices to produce the required proportion, usually a 5 to 1 combination. Regardless of what diluent gas is mixed with butane, a Calorimixer with Askania control on the butterfly valves serves to maintain constant heating value in the gas. While the mixing is performed principally to reduce the richer butane to the generally-used heat value of 500 B.t.u., the butane can also be used to enrich blast-furnace gas if it falls materially below the desired 100 B.t.u. per cu. ft.

A second butane gas auxiliary has been installed in the Rouge glass plant. Only butane vapor is made at this station. It includes two tanks of liquefied gas and two vaporizers to provide fuel in case of a gas shortage.

■ ■

Firms Order New Furnaces

Firms recently contracting for continuous porcelain enamel furnaces fired with gas radiant tubes include the George D. Roper Company of Rockford, Ill. and Servel, Inc., of Evansville, Ind.

Ensign Carburetor Co. Opens New Branch in Dallas

GILBERT WOODILL

Gilbert Woodill, sales manager, Ensign Carburetor Co., Ltd., Huntington Park, Calif., announces that a branch will be opened at Dallas, Texas. There the company will maintain complete stocks of all sizes of Ensign equipment for distribution to sales and service representatives as well as to users in the various Texas, Mid-Continent and Gulf Coast oil fields. Mr. Woodill will supervise the opening of this branch, which he plans to have ready for business early in August.

L. C. Arter, who has had wide experience in the Texas and Gulf Coast territory as well as eastern and midwestern states, will be in charge of the Dallas branch. He has been with Ensign Carburetor Co. for 15 years.

■ ■

Court Throws Out Ruling on Panhandle Service to Fulton

An order of the Missouri Public Service Commission that Panhandle Eastern Pipe Line Co. must furnish natural gas at reasonable rates to Fulton, Mo., has been held void by Missouri Supreme Court on the ground that the gas transported by the company is in interstate commerce and not subject to the Public Service Commission law.

The company sends gas from fields in Texas and Kansas through the states of Oklahoma, Kansas, Missouri, Illinois, and into Indiana, selling on contract to local distribution systems and to industrial plants. The court held that the gas is in interstate commerce until it enters the distribution system, even though the company served gas to industrial consumers in the city and exercised the right of eminent domain in acquiring rights of way.

■ ■

Sidney McIntire to Manage Sprague Meter Laboratory

Sidney McIntire, formerly of the Gas Service Co., of Topeka, Kan. has been engaged by the Sprague Meter Co., Bridgeport, Conn., as chief engineer, to take charge of the company's new experimental laboratory and engineering department.

Mr. McIntire is a graduate of the Kansas State College, where he received his degree in Mechanical Engineering. During the past four years he has been employed as engineer by the Gas Service Co. where he devoted the major part of his time to meter study.

■ ■

Ward Heater Appoints Lovell To Cover New York State

Appointment of Herbert A. Lovell as a district representative of the Ward Heater Co. has been announced by Horace J. Smith, president. Mr. Lovell will look after Ward Floor Furnace sales in the state of New York (with the exception of the city of Buffalo), and in Connecticut and New Jersey. His offices are at 455 Chanin Building, 122 E. 42nd Street, New York City.

Mr. Lovell has long been in gas appliance merchandising. He has been connected with the Brooklyn Union Gas Co. and the Lovekin Water Heater Co. For the past twelve years (until a few months ago) he covered New York and Connecticut for the Welsbach Co.

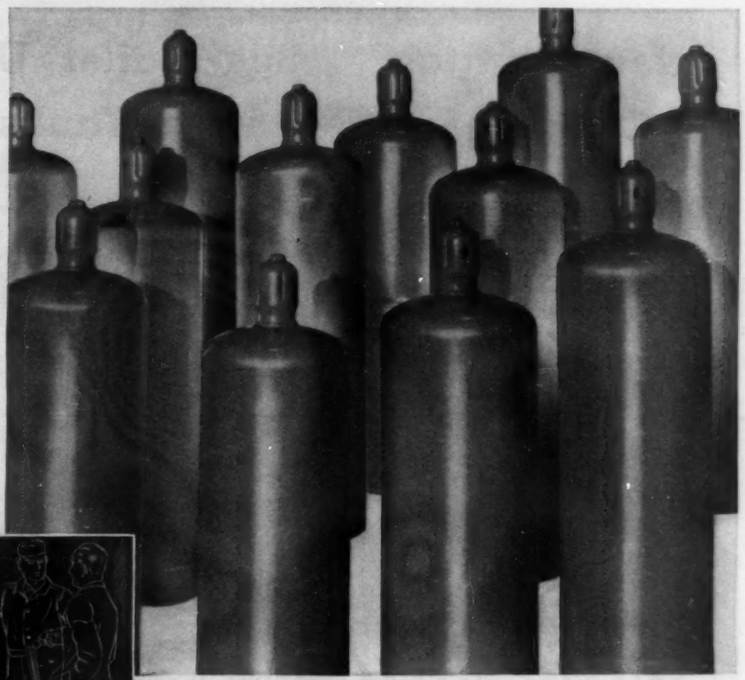
Ward Floor Furnace sales are now handled through direct representatives with offices in Chicago, Dallas, Kansas City, Pittsburgh, San Francisco, and New York. Factory and general offices of the Ward Heater Company are located in Los Angeles.

Union Springs Butane Plant Has 8 Miles of Line

The municipal butane-air gas plant at Union Springs, Ala., completed on May 5, is adding about three customers a week, according to Joel Rainer, city clerk. Thirty-five installations were completed by the middle of July. It is estimated that the plant will eventually serve about 200.

The plant was financed by PWA funds, at a cost of $50,000. It consists of 8 miles of mains of 6-, 3-, 2-, and 1½-inch pipe. Fuel of 530 B.t.u. is served. The city sells appliances.

J. O. Chappell is superintendent of the plant.



WITH HACKNEY CYLINDERS SPECULATION IS ELIMINATED

● The elements of chance and uncertainty have been removed before Hackney cylinders go into service. Thorough and competent inspection of materials, careful and time-tested design, and precision manufacturing, based on years of experience, provide absolute dependability.

Uniform strength and capacity is assured. A carefully guarded proper balance between strength and light weight is attained which results in shipping and handling economies and insures the satisfaction of the user.

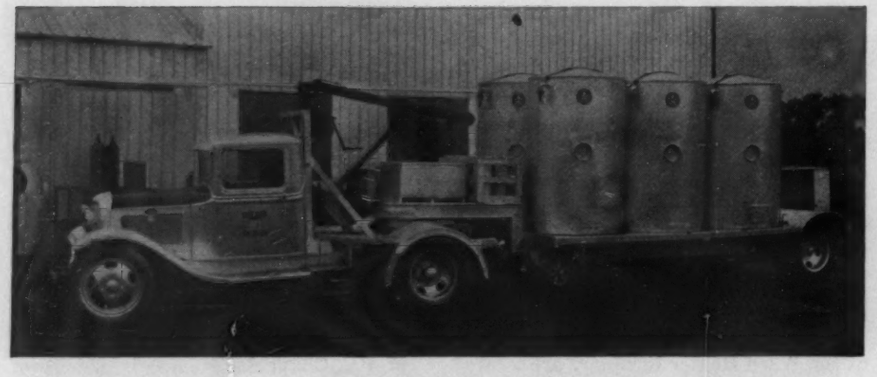
The exceptional service records which Hackney containers have established, under severe as well as ordinary conditions, are proof of their durability and of their ability to meet all of the requirements of the chemical, gas and other industries. Write for complete information about Hackney cylinders, tanks, drums and barrels for your particular needs—no obligation.

Hackney MILWAUKEE

PRESSED STEEL TANK COMPANY

208 S. La Salle St., Rm. 1185, Chicago
666 Roosevelt Building, Los Angeles
1363 Vanderbilt Concourse, New York
1463 South 66th Street, Milwaukee

Containers for Gases, Liquids and Solids



This "New Stargas" transport unit, which embodies latest designs for safety, is constructed to carry six customer tanks, complete with gages and draft eliminators.

"New Stargas" Truck-Trailer Unit Carries Six Customer Tanks

A SPECIAL truck and trailer unit has been designed for Lone Star Gas Co., Dallas, Texas, to facilitate transportation of "New Stargas" butane customer tanks from the assembling and testing shop in Dallas to the company's distribution centers. It carries six tanks, complete with gages and draft eliminators, instead of only four as did the old truck and trailer. The new unit also embodies the latest designs for safety to decrease the possibility of accidents to the men handling the equipment.

The trailer is of the drop-frame type, which makes for easy and safe handling, and for unloading with greater speed. A fifth wheel permits the truck to be unhitched from the trailer. This makes it possible for a safety crane on the truck to be used to unload the tanks from trailer to platform. The truck crane eliminates the necessity for a special crane at each distribution point, as well as the need for tying up a local installation crew and truck to unload and place the tanks in storage.

The crane moves from side to side only when the operator turns the crank. The cable used to raise and lower tanks is attached to an especially designed winch of worm-and-gear type so that the crank has to be turned either to lower or raise the tank. Because of the safety winch and worm-and-gear, no "dogs" are necessary to hold the load in case the operator lets loose of the crank. The operator can stand on the opposite side of the truck and pick up or lower a tank.

Special hold-down lugs on the three legs of each tank bolt through the steel bed of the trailer, holding the tanks in place while in transit. The lugs are put on or removed by tightening or loosening a nut located above the trailer floor. A three-way strap holds the jacket top in place and boxes are used to carry the gages and draft eliminators.

■ ■

Cities Service Reconditions Quapaw and Tallant Lines

Cities Service Gas Co. has started to recondition its Quapaw 16-inch pipe line across the Neosho River bottom near Commerce, Okla. The company states that three miles of new 16-inch pipe will be laid and tied in with welded construction. The old coupled line will then be lifted and reconditioned, and the usable pipe relaid with welded construction for a distance of approximately 1½ miles.

The 18-inch Tallant-Cotton Valley pipe line is also being reconditioned. The work will include the laying of two miles of new pipe at various points.

■ ■

Humble Laying 39-Mile Line

Humble Oil & Refining Co. will build 39 miles of 8-inch welded pipe line from its Harris County Satsuma station to its refinery at Baytown. It is being constructed to handle increased capacity upon completion of Humble's gasoline plant in the Tomball field.

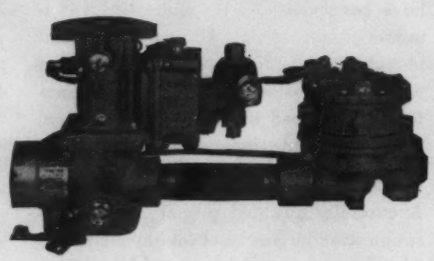
■ ■

Grant Survey in Emmetsburg

The city council of Emmetsburg, Iowa, has granted permission to The Gas Service and Engineering Corp., St. Louis, Mo., to make a survey of the community for gas service.

ENSIGN Combination CARBURETOR Gas and Gasoline ★

Throughout the power world, the name Ensign has symbolized fine precision carburetors and fuel regulating equipment of highest quality, for over a quarter of a century.



Combining all the advantages of both gas and gasoline carburetors in one unit, this Ensign Combination Carburetor permits instant change from one fuel to the other. Adapted to practically all types of stationary engines. Write for catalog.

ENSIGN CARBURETOR CO., Ltd.
HUNTINGTON PARK • CALIFORNIA
Branches: Chicago, Illinois; Dallas, Texas

Minneapolis-Honeywell Staff Changes Announced

E. B. EVLETH, affiliated with the Minneapolis-Honeywell Regulator Co. for twelve years, has been appointed vice-president and general manager of Minneapolis-Honeywell in Philadelphia. Mr. Evleth succeeded William J. Hajek, who has taken a six months' leave of absence before resumption of active duties with the Minneapolis office of Minneapolis-Honeywell.

C. L. Saunders, former regional sales manager at Chicago, has been appointed to succeed Mr. Evleth as resident vice-president in charge of the midwest region for Minneapolis-Honeywell.

Charles C. Cochran, formerly of the Milwaukee office, has been transferred to Chicago to assist Mr. Saunders in midwest non-industrial sales activities. John B. Banks has been transferred from Chicago to Milwaukee as district branch manager. O. B. Wilson, who has been manager of the industrial division of the Chicago office, will extend his activities over the midwest region.

Minneapolis-Honeywell recently took over the entire seventh floor of the Furniture Exhibition Building, Chicago. Controls and instruments manufactured by the company are exhibited under actual operation.

■ ■

Connelly Markets Improved Mercury Seal Valve

Development of an improved mercury seal valve for positive control of gas flow is announced by Connelly Iron Sponge & Governor Co., Elizabeth, N. J. When placed ahead of the meter on service lines, this unit, the company states, eliminates hazards resulting from interruption of gas supply or even the slightest pressure drop below the safe minimum.

The mercury seals the valve shut in closed position and it cannot be opened except by the inspector with valve key. The valve can be adjusted for functioning at any desired minimum pressure.

This mercury seal valve can be used to advantage on high-pressure house governors in place of the usual mercury seal, or to provide a positive safety shutoff for pilot lights. It is suitable for pressures up to one pound, and is made in all pipe sizes from ¼- to 4-in. with threaded connections.

■ ■

C. B. Shaklee Resigns From Western Gas Co.

C. B. Shaklee has resigned as vice-president and general manager of The Western Gas Co. of Washington, Bremerton, Wash., to enter the gas appliance merchandising field in that city.

Mr. Shaklee entered the natural gas industry in 1925, and managed the construction and operation of systems in several towns in Kansas until 1930. At that time he was transferred to Washington to take charge of the construction and operation of The Western Gas Co.'s plants and distribution systems in Longview, Bremerton, and Kelso. In 1936 the company was sold to E. H. Cookingham and associates of Lindsay, Calif., the deal being completed on June 1 of this year.

PARKHILL-WADE INC
CONSULTING AND
CONSTRUCTION ENGINEERS
973 NORTH MAIN STREET
LOS ANGELES CALIFORNIA

THE MARK OF
A JOB WELL DONE

WHETHER it be the erection of a complete Natural Gasoline Plant or merely the installation of a Butane Storage Tank, *this symbol is the mark of a job well done!* It is the sign of a job soundly engineered, capably fabricated—a job that will be finished and in full operation within the specified time limit. Watch for this symbol. *Remember it!* Then, when planning your next job, avail yourself of the services of the specialized organization it represents. * * *

Parkhill-Wade, Inc. design and erect Gas Dehydration Plants... Natural Gasoline Plants... Stabilization Plants... Dust and Liquid Scrubbers ...Butane Production Units... Butane Storage Equipment . . . Butane Dispensing Equipment.

EXCLUSIVE design of Mueller Gas Era Furnace gives longest life—lowest operating cost.

L. J. MUELLER
FURNACE COMPANY
MILWAUKEE

High-Pressure Testing of Old Mains and Services

(Continued from Page 21)

pressor are then set up, care being taken to connect compressor to test area through by-pass on meter. It was thought inadvisable to run gas from compressor through meter due to the high temperature of compressed gas and resultant disastrous effect on meter diaphragms.

A recording pressure gage, 0-12 lbs. range with one-hour clock, is connected to the inlet of the compressor and a minimum of 1½ lbs. per square inch pressure is maintained at that point when procuring gas from a high-pressure system. A recording pressure gage, 0-100 lbs. range with one-hour clock, is connected to the discharge of the compressor beyond the test meter. The location of the above gages may be seen by referring to Fig. 1.

The addition of a small odorizer on the compressor discharge was early found to be a convenient means of assisting in quickly locating peaks (see symbol "3" of Fig. 1). This odorizer is set to drop from 40 to 50 drops per minute before starting the compressor.

Men are distributed over the area under test in such manner that one man can patrol his area thoroughly at least every 10 minutes. This includes following main and service lines to shut-off points.

It has been found convenient to check the complete isolation of an area by lowering pressure in the area by one pound for a period of five minutes before starting test. All meters in the area are turned off and blank washers inserted at inlets. The area is first given a check test through the meter at ordinary operating pressure using a mercury column or water column for observing pressure during test. In ordinary practice, this preliminary test runs for 30 minutes.

On completion of the preliminary flow test, the compressor is started and patrolmen begin to observe territories closely. The pressure is first increased to 10 lbs.; then the compressor is shut off and the pressure drop is observed for two minutes and the loss in cubic feet per hour is calculated by means of Tables Nos. 1 and 2. The above operation is repeated in steps of 10 lbs. until 80 lbs. is reached.

Table No. 2. Loss of Gas Corresponding to a 1-lb./sq. in. Drop in Pressure

Cubical Contents at Atmosphere	Cu. Ft. Loss for 1 Lb. Drop in Pressure
1	.068
2	.14
3	.20
4	.27
5	.34
10	.68
15	1.0
20	1.4
25	1.7
50	3.4
100	6.8
150	10.2
200	13.6
250	17.0
300	20.4
350	23.8
400	27.2
450	30.6
500	34.0
550	37.4
600	40.8
650	44.2
700	47.6
750	51.0
800	54.4
850	57.8
900	61.2
950	64.6
1000	68.0

Repairing Bad Leaks

If a bad leak is indicated before the pressure has been raised to 80 lbs, the compressor is stopped, the leak is located and repaired and the process continued as above to 80 lbs. The pressure is then reduced to the normal operating pressure and another flow test made. If leakage has increased, leaks are located and repaired. The use of a gas detector may be necessary to locate such leaks.

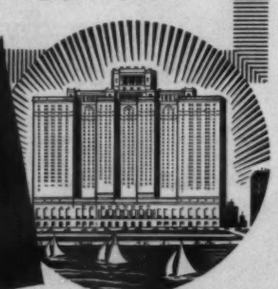
After completion of satisfactory flow test, blank washers are removed, meters turned on and all pilots lighted.

High-pressure tests as described have been conducted on high-pressure systems without shutting off con-

COOL AND COMFORTABLE

Air-cooled guest rooms, dining rooms, lobbies, meeting rooms, ballrooms, coffee shop and barber shop will assure you complete comfort during your summer visit to Chicago.

The Stevens Hotel offers the greatest amount of air-cooled area of all of the hotels in Chicago. Enjoy this crowning touch to the surpassing comfort always found at the Stevens.



STEVENS
"America's Grand Hotel"
CHICAGO

OTTO K. EITEL, *Managing Director*

You Can PUSH PIPE FASTER and EASIER *With a Greenlee Hydraulic Pipe Pusher*

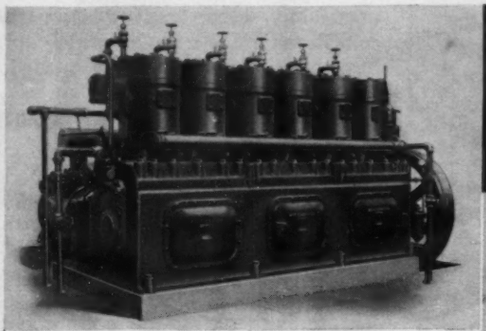
One man, standing in a comfortable position, can exert a pressure of 40,000 pounds on the pipe clamp.

This powerful, compact tool offers you a real short cut on underground installations. It reduces time and labor expense by eliminating much trenching, back-filling, etc. It saves tearing up lawns and pavements and requires only one man to operate the levers.

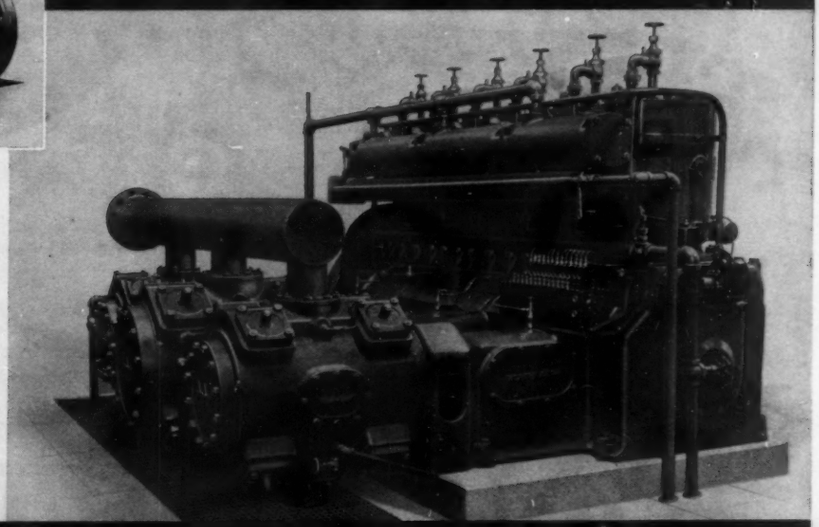
With the Greenlee, all that is needed is a trench long enough to accommodate the pusher with a section of pipe. As the pressure is applied by pumping the handles, the power unit moves forward on a notched steel base, forcing the pipe through the earth. Considerable time is saved, since the pipe clamp is changed only every 4 to 7 feet, depending on the length of base used. It will push pipe up to 4-inch, has eight speeds for varying soil conditions and will exert a pressure of 40,000 pounds on the pipe clamp.

Why not investigate this improved method of pushing pipe for all underground installations? Complete information will be sent gladly and without any obligation to you. If desired, we shall also be glad to furnish names of users.

GREENLEE TOOL CO., 1700 Columbia Ave., ROCKFORD, ILLINOIS



THE WORTHINGTON ANGLE GAS ENGINE COMPRESSOR



Type LCE
4-cycle

- *Economical*
- *Compact*
- *Accessible*

Suitable for repressuring and distribution service

Sizes: 75-hp., 150-hp., 225-hp., 300-hp.

Literature on request

WORTHINGTON PUMP AND MACHINERY CORPORATION

General Offices: HARRISON, NEW JERSEY - Branch Offices and Representatives in Principal Cities throughout the World

WORTHINGTON

sumers' meters and as a result of these experiments, it is planned to conduct future tests without shutting off consumers' meters. Small safety valves are to be installed at each meter inlet so that, if the regulator builds badly, gas will be released before a dangerous pressure is reached. This safety valve will be left on the meter set only during time area is under test. They are to be set to blow at 20 in. of water, this pressure having been previously determined by experimental work as that below which pilot lights are not seriously affected.

Fig. 1 shows the compressor in use by the Pomona district, with necessary attachments. A two-stage, air-cooled compressor, maximum pressure 80 lbs., operated by a gasoline engine, is mounted on a two-wheel trailer. In practice, the engine is only started on gasoline and switched to natural gas as soon as it is warmed up.

Various additions to the original equipment have been made as experience indicated their necessity or convenience. It was early learned that a gas filter on the compressor inlet is absolutely necessary to avoid ruining the compressor. Several so-called "gadgets" have also been added because they simplify operation and add to safety. It was found that connecting inlet and outlet gages to lines direct did not give satisfactory charts because of pulsation produced by the compressor, so lines were run to small containers made of six-inch pipe which act as cushions, resulting in more even recordings on the charts.

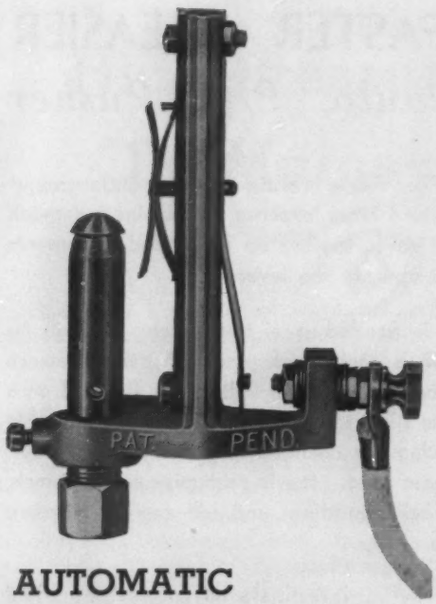
Results

It is rather early for a definite indication of results, as time will be the only sure gage of the value of this work. At the present time, our company has six of these compressors in operation. This number supplies the needs of each district and each leakage crew is programmed to use this method to a large degree in future work.

In a number of instances, it has been readily apparent that weak spots have been found and repaired when we were looking for them and could repair them with a minimum of time and expense, whereas any one of them might have given way under ordinary conditions in a manner which might have been at the least very hazardous.

The examination of old mains which have been subjected to 80 lbs. pressure under this method has shown, in cases of pitted pipe, that small pit holes with only 2 or 3 thousandths of an inch of metal remaining at the bottom, have withstood the pressure test, due mainly to the small area exposed. These pits would undoubtedly leak in a comparatively short time after completion of tests. In some instances, where only a comparatively thin shell of pipe was held in place by surrounding soil, the value of this method has been very evident as this condition was exposed and had not been evident under normal operating pressures.

The true measure of the value of this method lies in definitely establishing the fact that after a section is thus tested, a considerable period of time will elapse before it is necessary to repair leaks in the area. From the results evident to date, it would appear that this method has possibilities within limits; but undoubtedly there will be cases, as in the pitted pipe referred to above, where the results will not be all that could be hoped for as far as furnishing a guarantee



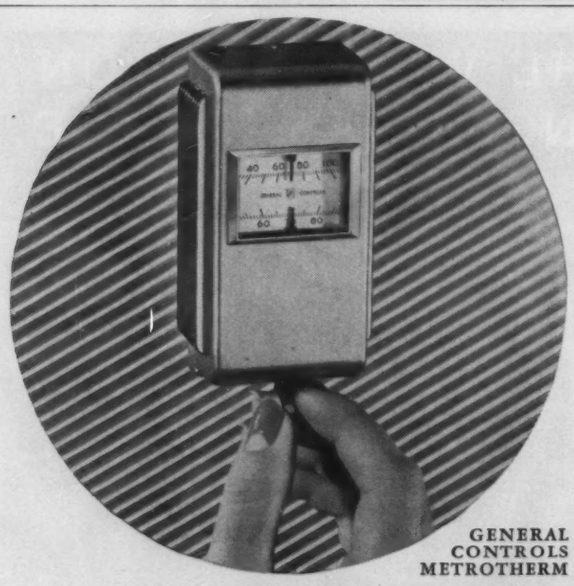
AUTOMATIC CONTACT PILOT

Works equally well with every type of remote furnace control, whether thermostat or push-button. Makes every furnace installation modern. Moderate in cost—easy to install. Write for prices and details.

◆

DOMESTIC MANUFACTURING CO.
700 East Florence Ave. Los Angeles, Calif.

Patents and Trademarks
Protect your most valuable assets. Expert service. Prompt attention.
Write
LESTER L. SARGENT
Registered Patent Attorney
1115-K St., N. W., Washington, D. C.



GENERAL CONTROLS METROTHERM

ACCURATE

Low thermal inertia • Adjustable heat acceleration • Silver and chrome finish

A PRODUCT OF GENERAL CONTROLS
New York Cleveland San Francisco Kansas City

ORIGINATORS OF THE QUIET A. C. SOLENOID

that the main so tested will be without leakage for a definite future period.

SELECTED BIBLIOGRAPHY

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■ ■

Penn Electric Switch Names Luscombe Sales Manager

Robert H. Luscombe has been named sales manager of Penn Electric Switch Co., Des Moines, Iowa, according to an announcement by Malcolm E. Henning, executive vice-president.

Mr. Luscombe has been connected with Penn Electric for three years, first in charge of sales to the gas heating industry and to accessories' jobbers and distributors and more recently as manager of the company's New York branch office. Prior to joining Penn, he was in charge of industrial and space heating sales for the Des Moines Gas and Electric Company. He has been active for many years in the affairs of the American Gas Association and the Mid-West Gas Association.

Mr. Luscombe will continue to direct activities of the company's New York branch until Penn Electric completes the move to its new plant and office at Goshen, Ind., at which time he will take over active sales management duties at the factory for both domestic and foreign sales.

■ ■

E. S. McKay Appointed Editor Of Public Utility Pioneer

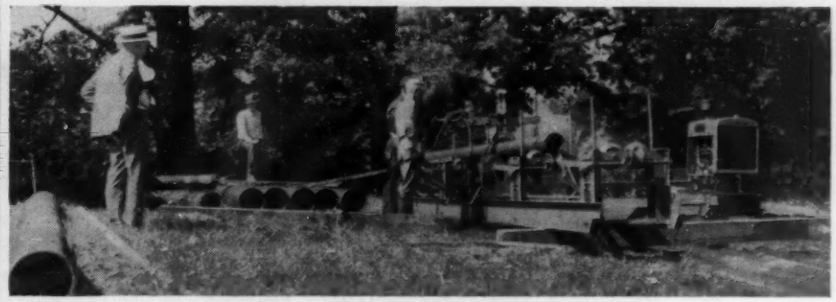
Edward S. McKay has been appointed editor of PUBLIC UTILITY PIONEER and assistant to Publicity Director J. W. Hicks of Public Utility Engineering and Service Corp., Chicago. Mr. McKay, as editor, succeeds Laura G. Jackson, who resigned to become associated with the American College of Surgeons.

Mr. McKay has been with the General Electric Co. since his graduation in 1933 from the University of Michigan. For two years he was in the publicity department of the company at Schenectady. Since 1935 he has been district advertising and publicity representative in Chicago.

THERE'S NOTHING "TECHNICAL" ABOUT THE PERFORMANCE OF

NEW IDEAL Pipe Cleaning Machines

They do the work rapidly, efficiently, and at low cost. One New Ideal Pipe Cleaning Machine cleaned 946,120 ft. of pipe (12" and smaller) at a cost of .00043c per foot for an Arkansas gas company. Other machines have cleaned in excess of a million feet for Mid-Continent oil and pipe line companies, usually without repairs or replacement of cleaning blades.



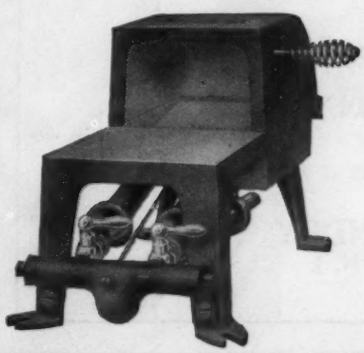
New Ideal Hi-Speed Model Pipe Cleaning Machine in service of the Equitable Gas Company in W. Va.

Buy "New Ideal" Pipe Cleaning Machines and let the "technical department" go fishing, so far as your pipe reconditioning worries are concerned. There is nothing "technical" about their ability to get the job done. We have pipe cleaning machines of several models and sizes. There's one to meet your specific requirements and it will pay for itself in speed, uninterrupted operation and thorough cleaning.

Even the technician and the efficiency engineer appreciate the efficiency, economy, and non-technical ease of operation of New Ideal Pipe Cleaning Machines, and Duo-Hydraulic Pipe-Straightening Machines. Used throughout the United States and in many foreign countries, including Canada, Colombia, Venezuela, Rumania, Syria, Iran, etc. Write for illustrated catalog today, or see 1937 Composite Catalog.

The NEW DEAL SPECIALTY CO.
— INC. —
OKMULGEE, OKLA., U.S.A.
Export: Lucey Export Corp., New York and London

Powerful Johnson No. 502 Soldering Furnace



An efficient, economical Bench Furnace that is a real value in every respect. Contains many exclusive and patented Johnson features. Designed to heat soldering coppers up to 12 lbs. per pair. It can also be used for heat-treating or metal melting. Cast iron construction. Equipped with two Powerful Johnson Direct Jet Bunsen Burners, each with shut-off valve and pilot light. No forced air blast required. Write for free catalog.

JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA

Competition was not very strong when an old coal burning stove tried to keep pace with a modern gas range in a demonstration staged during the Oklahoma Natural Gas Co.'s Old Stove Roundup.

Oklahoma Natural's Drive Rounds Up 2545 Old Stoves

By J. C. ALBRIGHT
Staff Correspondent

CO-OPERATING with dealers of household appliances to increase sales in the greater part of Oklahoma, Oklahoma Natural Gas Co. carried out a six-weeks' Old Stove Roundup. only to build greater load but to enlist The object of this campaign was not the co-operation of dealers in the territory so that when other campaigns were begun, work of organizing dealers into districts and teams would have been partially completed.

Conducted strictly as a co-operative program, the campaign resulted in 2545 sales, approximating $228,000 for dealers. H. Vinton Potter, merchandise sales manager of Oklahoma Natural Gas Co., was in charge of the comprehensive campaign.

The public first learned of the Old Stove Roundup in teaser ads in newspapers. Oklahoma Natural Gas Co. sent out an assortment of copy for such use by its local managers. In the Sunday papers following the teaser ads, the gas company ran announcement advertisements. The Sunday papers also carried news stories about the Roundup. Individual dealers also advertised, the majority featuring an Old Stove parade and urging the reader to "Watch for It!"

Parades in most localities were held on the Monday following the announcement. In advance, aerial bombs were fired to attract attention; but before the bombs were set off, all local radio stations and newspapers were notified so that when people telephoned they could be told that dealers were sponsoring an Old Stove Roundup and that a parade of old stoves would soon start to the junk pile.

The parades, fairly uniform for all towns, included motorcycle policemen, traffic officers, a cowboy band, young cowboy riders known as the Mounted Troops of America, dealer vehicles carrying new appliances, and gas company trucks carting worn-out units to the trash heap. Some of the trucks were decorated. Others contrasted old and new ranges. In Tulsa, one truck had at the rear a two-hole, round firebox "Topsy" stove, fired with coal. Black smoke poured from the stove pipe. Smoked pots cluttered all available space. As a contrast, a modern gas range was placed on the front end of the truck, with a colored cook preparing a meal with spotless utensils.

A parade novelty was a worn-out automobile which rattled and shook and was plastered with stickers, saying: "You wouldn't drive an old car. Why use an antiquated gas range?" Sound trucks accompanied each parade. Announcements were furnished to sales managers by Oklahoma Natural Gas Co.

Local Tie-ins

Whenever possible the parades were fitted into local celebrations and other activities. In Enid, where a "Cherokee Strip Opening Celebration" is held each year, the gas company manager offered a prize to the person who was dressed most like a claim-owning pioneer. Handbills were distributed outlining the rules. Enid, as a result of this and other sales activities, led the state in passing the quota of range sales.

The Home Service Department carried a modern kitchen to more than 40 towns and cities in the trade territory. These demonstrations continued from two to four days. A girl in a costume of the '90's tried to duplicate with a wood- or coal-burning range the work being done by a Modern Maid with a 1937 range. The demonstration was planned so that it required about two hours properly to cook a pan of soda biscuits in the old stove. At the end of the demonstration, the Modern Maid threw a lasso over the old stove and old-fashioned cook and pulled them off the stage.

Another feature that proved successful was the assignment of Oklahoma Natural Gas Co.'s entire Home Service staff to a city for its Old Stove

U. S. SUPER de LAVAUD
CAST IRON PIPE
"Cast without chill in a metal mold"
U. S. PIPE AND FOUNDRY COMPANY
Burlington, N. J.

PROOF

that MORE Manufacturers are turning to GAS to carry their Sales Messages to the NATURAL Gas Industry

◆

ADVERTISING RECORD

First 6 months—	1936	1937	GAIN
GAS	209 Pages	285 Pages	76 Pages
American Gas Journal	121 "	166 "	45 "
Gas Age-Record	493 "	501 "	8 "

GAS

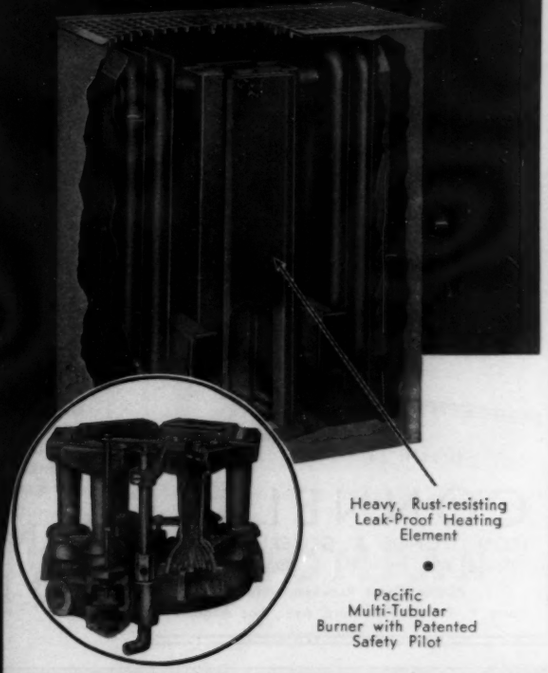
The fastest-growing publication in the Industry—both in circulation and advertising! Advertisers who are cashing in on this fact used more additional pages in advertising in GAS in the first 6 months of 1937 (as compared with the same period in 1936) than in the other two gas industry magazines, combined.

Your Sales Message in GAS reaches the most active section of the GAS Industry — the NATURAL Gas Men. Over 62% of the total revenue of the Gas Industry in 1936 was received by *Natural* Gas Companies.

ABC **GAS** ABP

LOS ANGELES 810 S. Spring St. | HOUSTON 306 Shell Bldg. | CHICAGO Peoples Gas Bldg.

The Hidden Success of PACIFIC Floor Furnaces



Heavy, Rust-resisting Leak-Proof Heating Element

Pacific Multi-Tubular Burner with Patented Safety Pilot

• Here is a floor furnace engineered and constructed to the most exacting detail, to give perfect performance and extra long life. Heavy, rust-resisting, leak-proof heating element, and the famous Multi-tubular burner with patented safety pilot, are just a few of the reasons why Pacific Floor Furnaces lead the quality field in performance and economical operation. Of course they are A. G. A. approved.

The New Pacific Single or Dual Register Floor Furnace with Modern Grille

A Pacific for Every Heating Need

- Duct Unit Heaters
- Blower Furnaces
- Gravity Furnaces
- Forced-Air Units
- Gas Steam Radiators
- Water Heaters
- Circulators

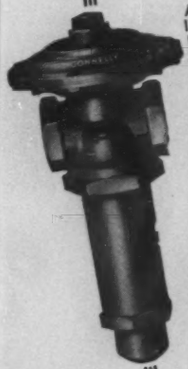
We will be glad to send you complete literature —write for it today!

PACIFIC GAS RADIATOR COMPANY

1740 W. WASHINGTON BLVD., LOS ANGELES, CALIF.

CONNELLY

BACK PRESSURE RELIEF VALVE



ADAPTABLE for line pressures up to 125 lbs.
DEPENDABLE on high-pressure storage tanks in compressor by-pass or any duty requiring positive safety relief.
ACCESSIBLE for easy inspection.
AVAILABLE in standard pipe sizes, ¼-4".

Connelly Products: Regulators for Station, District, Service and Appliance —Back Pressure Valves — Mercury Seal Valves—Calorioptic BTU Indicators — Iron Sponge and Unmixed Oxide — Distribution Supplies.

Write for Bulletins

CONNELLY
IRON SPONGE & GOVERNOR CO.
Chicago, Ill. Elizabeth, N. J.
Pacific Coast Representative:
Harry V. Payne, 3834 Third Ave., Los Angeles

SERIES 10 CIRCUIT

Exclusive with Minneapolis-Honeywell

ONLY Minneapolis-Honeywell can offer the control performance made possible by the exclusive Series 10 Circuit. That is one important reason why it pays to standardize on this superior line of controls. In addition your service department can operate more efficiently and will have fewer calls, and your stock room will have to handle only one line to fill all control requirements. Minneapolis-Honeywell Regulator Co., 401 East 28th Street, Minneapolis, Minn.

MINNEAPOLIS HONEYWELL
Control Systems

HIGH CAPACITY—SMALL SIZE!
LOW PRESSURE REGULATORS

AGA—LISTED
Write for more information.

Built in TWO Sizes

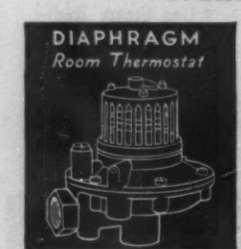
½ in. Size
over all dimensions
only 5 inches.

¾ in. Size
over all dimensions
only 6 inches.

Exceptional high output—perfect regulation at all pressures—low lockup. A small size—low cost regulator with highest capacities for all types of gas appliances.

The H. M. Thermo Control Co.
814 E. 108th St. Los Angeles, Cal.

BUILD YOUR HOUSEHEATING LOAD WITH KLIXON CONTROLS



These two advanced Klixon devices give exact automatic temperature control and assure positive pilot protection for your gas-fired space heaters . . . provide sales features that make it easy to sell gas heating.

Write today for descriptive bulletins.

SPENCER THERMOSTAT COMPANY
Unit of Metals & Controls Corporation
87 FOREST STREET • ATTLEBORO, MASSACHUSETTS

Roundup Demonstration Day. A member of the staff was stationed at the store of each participating dealer. Newspaper advertising was used by both the gas company and dealers.

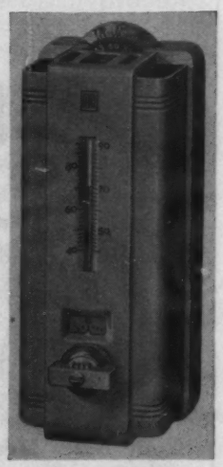
A silver dollar was given to each gas company employee who turned in a lead resulting in a sale, even though the sale was not closed until three months had elapsed after the close of the campaign. Employee leads were given to two competing range dealers, so that the dealers would realize the importance of following the tips immediately.

All advertising featured a cowboy mounted on a bucking horse. Cuts were prepared for dealers and local gas company managers to use in the 55 newspapers in the territory. The company also prepared window banners, window stickers, show cards, and inserts to be mailed with the monthly bills of both dealers and gas company.

Prizes were offered to district sales managers on a percentage basis, and to salesmen on a per-range-sold basis.

■ ■

Acratherm is Latest Control By Minneapolis-Honeywell



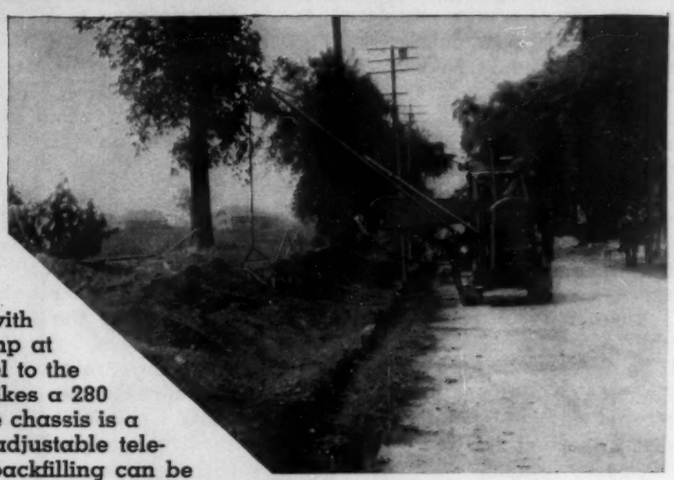
Minneapolis-Honeywell Regulator Co. has placed on the market a Da-Nite Acratherm which combines the Acratherm and the Time-O-Stat. This thermostat, the company states, offers in one instrument, manually lowered temperature, day or night, with its resultant fuel economy; automatic return to the desired temperature level whenever wanted, and the accuracy of control provided by Minneapolis-Honeywell "Heat Acceleration."

The Da-Nite Acratherm is equipped with a black setting wheel and winding knob—both on the same shaft, presenting the simplest of adjustment features and eliminating the necessity of arithmetical calculations. The temperature setting can be made at any point as low as 45° by simply moving the indicator to the desired lower temperature scale. The thermometer is recessed to guard against breakage. A dial lock screw is furnished as standard equipment to prevent tampering with the temperature setting, and a locking device for the cover is available at no additional cost. The Da-Nite Acratherm is furnished with a detachable wall plate for mounting and an adjustable differential. The day scale range of the Da-Nite Acratherm is from 55 to 85° F., while from 45 to 75° F. is the night scale.

ASSURE A SAFE BACKFILL WITH . . .

THE CLEVELAND TAMPER-BACKFILLER

And Save Money Besides



Improperly backfilled trenches are hazardous to the public—causing ill-will as well as accidents. They increase your costs, too, when necessary to repair a ditch that has settled.

All this can be avoided when you use the Cleveland Tamper-Backfiller to fill and compact the ditch. Best of all, the machine cuts the cost considerably.

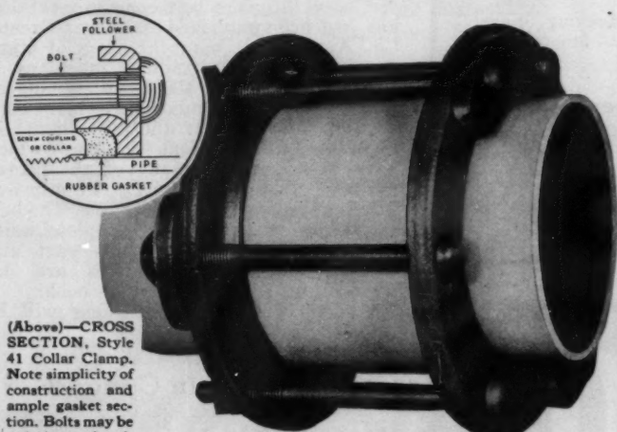
Here's a compact machine, crawler mounted, with a proven tamping unit that swings so as to tamp at either side of the machine while moving parallel to the trench or in the center while straddling it. It strikes a 280 feet-pound blow 45 times a minute. On the same chassis is a fast backfilling unit of the drag-line type, with adjustable telescopic boom. One-man operated-tamping and backfilling can be done simultaneously or separately as desired. The Cleveland Tamper-Backfiller is a mighty cheap form of public liability insurance and a real money saver. Write for details today.

THE CLEVELAND TRENCHER COMPANY

"Pioneers of the Small Trencher"

20100 St. Clair Ave. Cleveland, Ohio

FIX COLLAR LEAKS QUICK!



(Above)—CROSS SECTION, Style 41 Collar Clamp. Note simplicity of construction and ample gasket section. Bolts may be cadmium-plated.

Repairs to leaking collars are easy with Dresser Style 41 Collar Clamps! Easily applied by unskilled labor without interruption of the service, this repair clamp is inexpensive, can be furnished for any collar—old or new,—and is permanently tight for all pressures.

DESCRIPTION. Each Style 41 Clamp consists of a few, simple, factory-made parts (steel followers, gaskets, bolts), which are quickly assembled with only one tool—a wrench.

SIZES. Style 41 Collar Clamps are available in sizes 4½" to 12" I.D., inclusive. For sizes ¾" to 4" I.D., Style 4 (with malleable followers) is furnished.

HOW TO ORDER. Give: (1) quantity; (2) nominal size and outside diameter of pipe; (3) style number; (4) service—gas, water, etc.; (5) maximum working pressure; and (6) overall diameter and length of collar, where size or design of collar is special.

OTHER DRESSER REPAIR CLAMPS

Style 4 Collar Clamp is like Style 41, except made for sizes ¾" to 4" I.D. only.

Style 55 Porous-Weld Clamp repairs porous circumferential pipe welds.

Style 74 Screwed-Fitting Clamp is for repair of leaks through threads of screwed fittings.

Style 77 Band Clamp stops leaks through small holes or pits in pipe.

Style 78 Saddle Clamp repairs leaks in pipe 4" I.D. or smaller. Two or more can be butted together.

Style 79, Type 1, Split Repair Clamp fixes splits and pitted sections of pipe. Furnished also with one half-shell and stirrups (Type 2).

S. R. DRESSER MFG. CO.

BRADFORD, PA.

In Canada: Dresser Mfg. Company, Ltd., 60 Front St., West, Toronto, Ont.

Mid-West Association Develops Free Service Classification System

A UNIFORM system for classifying free service rendered to consumers has been developed by a committee of the Mid-West Gas Association, and first returns from the reports of participating companies were discussed at the 1937 Mid-West Convention by H. C. Holder, manager, Council Bluffs Gas Co., Council Bluffs, Iowa. Mr. Holder; C. D. Robison, operating engineer, Metropolitan Utilities District, Omaha, Neb.; and R. B. Searing, Sioux City Gas & Electric Co., Sioux City, Iowa, comprise the committee that worked out the classification form.

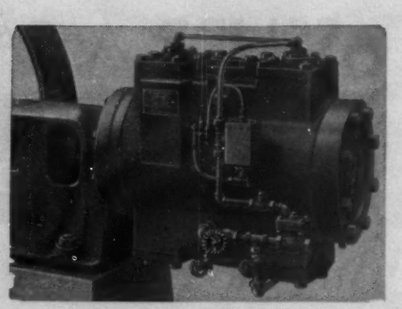
Mr. Holder confined his discussion to pilot outages on appliances, and included requested as well as non-requested service calls.

In the straight natural gas division, four properties submitted reports. They had an average of one call for pilot outages for each 168 ranges, one call for every 25 automatic water heaters, one call to each 9 refrigerators, and one call to each 17 central heating plant installations.

On gas ranges, Mr. Holder reported, the percentage of pilot outages was the same with manufactured and natural properties. On mixed properties, however, about twice as many calls were necessary for the same number of units. On automatic water heaters, manufactured properties had one call in 10, natural properties had one call in 25, and mixed gas properties showed one call in 72 units, which, the speaker pointed out, was the reverse of the findings with regard to ranges.

On refrigerators, the reporting manfactured properties were required to make a call for every 3 units, while natural properties averaged one in each nine units, and mixed gas properties reported one call for every 12 refrigerators.

Companies desiring to participate in keeping service records can obtain blank forms and all information from R. B. Searing, Sioux City Gas & Electric Co., Sioux City, Iowa.



Worthington Corp. Perfects Unloader for Compressors

AUTOMATIC start-and-stop control, combined with automatic loading and unloading, can now be obtained without additional equipment on motor-driven single-horizontal compressors, by using the magnetic unloader introduced by Worthington Pump and Machinery Corp., Harrison, N. J., according to an announcement by the company. No extra piping, valves or other devices are required.

This device operates on standard electric equipment and can be installed wherever a conventional automatic starter is used for controlling the compressor motor. The only other provision necessary is a pressure switch to operate a pilot circuit. The pressure switch control is transferred electrically from the motor starter to the magnetic unloader, and either position may be selected at will. If connected to the motor starter, the compressor starts and stops on the demand for air. When connected to the magnetic unloader, the compressor runs continuously and simply loads and unloads depending upon whether or not air is needed. If desired, the cooling water supply can be automatically controlled.

■ ■

Barber-Greene Issues Catalog On Belt Conveyors

A new 116-page belt conveyor catalog has just been published by Barber-Greene Co., Aurora, Ill., manufacturers of standardized material handling machines.

This book covers the complete line of Barber-Greene standardized belt conveyors, both portable and permanent. It includes Barber-Greene stackers which have been used on many of the larger material handling jobs. Twenty-five pages are devoted to job photos. The belt conveyors are shown as complete units in one section. The various part and standardized unit assemblies are described and illustrated in the book.

A copy of this new catalog will be sent on request.

■ ■

Condensation in Canada

E. O. Howle, president of Condensation Engineering Corp., Chicago, Ill., has organized a new company in Canada under the name of Condensation Engineering Co. of Canada, Ltd., to manufacture and sell its line of products consisting of the Condensation Eliminator, the Howle Heat Extractor, and Vitroliner, a porcelain chimney liner. E. O. Howle is president of the Canadian company, and J. J. Pearson, eastern representative of Condensation Engineering Corp., will direct the Canadian activities. Headquarters of the company are in the Helena Building on King Street, London, Ont.

The Goodman Stopper

The Reliable Shut-off for Street Mains

Equipped with Improved Patented Locking Sleeve, which locks both handles to the pipe. Stopper cannot slip. Gas cannot pass.

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FURNACES BLOWERS FILTERS WASHERS

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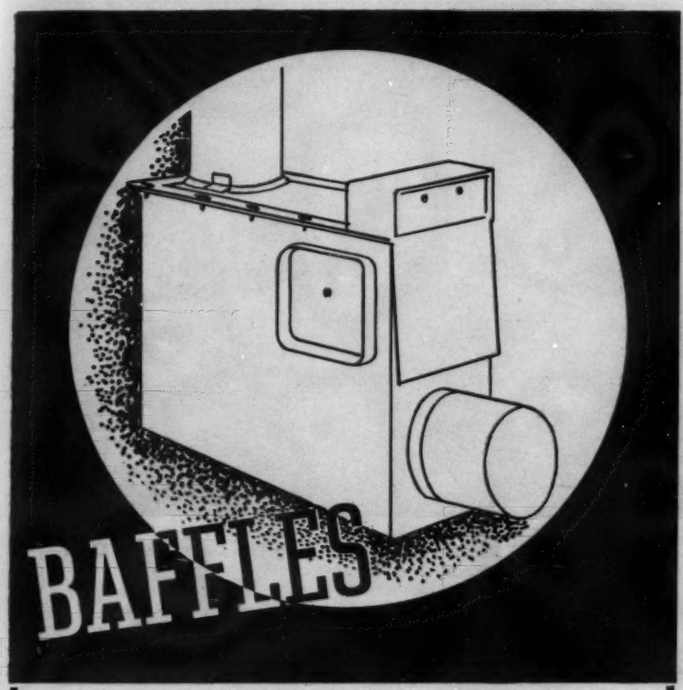

INCREASE THE EFFICIENCY OF HOME HEATING PLANTS

The Condensation Eliminator equipped with baffles, directs, controls, maintains, and retains an even flow of pre-heated air. Properly placed, up and down draft doors, reduce to a minimum the necessity of repeated heating of large quantities of cold air.

The Condensation Eliminator with VITROLINER, the PERMANENT CHIMNEY LINER, is a positive chimney safe-guard because acid bearing corrosive hot gases must flow up a vitreous enamel lined pipe instead of condensing and being absorbed by cold chimney surfaces, resulting in repairs and possible stack replacement.

Let Condensation Engineering Corporation show you how to save money.

Complete information and prices on our entire line of condensation equipment will be sent on request.

VITROLINER
the permanent Chimney Liner

CONDENSATION ENGINEERING CORPORATION

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335 South Western Avenue, Chicago

GAS CONTROL SINCE 1892

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SERVICE

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REYNOLDS manufactures a complete line of Gas Control Regulators. Each one in its line is designed and built to meet a specific requirement of the Gas Control field.

Correct principle, sound design and dependable performance are just three of the many reasons why Reynolds Gas Control Units enjoy preference on most specification sheets. These careful buying gas executives also know that the unquestionable after-installation performance of every Reynolds Unit is backed by nearly a half century of experience.

When your next Gas Control problem arises, call REYNOLDS —their cooperation policy is one too important to overlook.

*

REYNOLDS Products for all kinds of Pressure Reductions—for either Natural or Artificial Gas.

High Pressure Service House Regulators—Straight Lever Type—Models 0-10-20 Series. Toggle Lever Type—Model 30 Series.

Low Pressure Service or Appliance Regulators.

District Station Regulators, Single or Double Valve—Auxiliary Bowl and Automatic Loading Device Optional.

High Pressure Line Regulators—Pilot Loaded—Pilot Controlled.

Toggle Type Regulators—Single Valve, Double Valve, Triple Outlet.

Seals—Dead Weight or Mercury . Back Pressure Valves . Automatic Quick Closing Anti-Vacuum Valves . Automatic Shut Off Valves . Lever Operated Valves . Louver Operated Device . Atmospheric Regulators . Vacuum Regulators.

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ANDERSON, INDIANA, U. S. A.

NEW LOW COST
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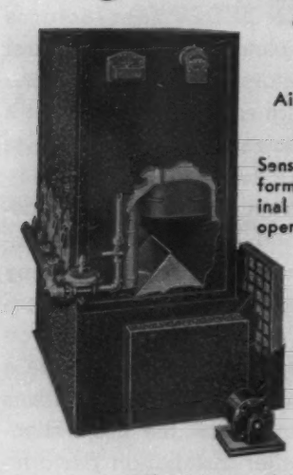

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Winter
Air Conditioning
System

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Write
for details
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Fraser Furnace Company
Stockton, Calif.

Distributed by
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San Francisco Los Angeles

A session of the three-day cooking school for negroes conducted by The Laclede Gas Light Co., St. Louis, Mo.

Laclede Gas Light Holds Cooking School for Negroes in St. Louis

BECAUSE St. Louis has a large negro population and many persons work in homes as cooks, The Laclede Gas Light Co. always has felt that it was wise to interest negro women in using gas in the kitchen. This year Laclede sponsored a negro cooking school for this purpose, in cooperation with the St. Louis *Argus*, a well-established negro newspaper.

The cooking school was held at the Pine Street Y. M. C. A. on May 24, 25 and 26. George H. Schlatter, Laclede's new general sales manager, arranged the demonstration.

Miss Hallie Carper, popular negro domestic science expert, demonstrated the three major uses of gas in a modern "all gas" kitchen that was constructed in the auditorium. The advantages of gas water heaters, gas refrigerators, and gas ranges were clearly defined to those attending the cooking school.

Laclede was also represented with a display booth at the main entrance of the Y. M. C. A.

Stop Loss of Holder Metal
NO-OX-ID controls corrosion chemically as well as mechanically. It is easy to apply, economical and long lasting. Top lifts, water tanks and tops of lifts should have a coating brush-applied. NO-OX-ID Water Seal coats the lifts by submersion and penetrates through the heaviest rust accumulations. Inquiries invited.
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Chalmer R. Cline Is Appointed To Laboratories' Staff

Chalmer R. Cline, a graduate of the University of Cincinnati in Chemical Engineering, has been added to the A.G.A. Testing Laboratories' staff, to assist Louis O. Howell, industrial gas engineer, whose appointment was announced in G A S last month. Mr. Cline was chemical and metallurgical assistant at the University of Cincinnati for two years. He has been employed in the engineering departments of Thew Shovel Company, and Commercial Steel Casting Company, Marion, Ohio. Until recently he was gas engineer at National Tube Company, of Lorain, Ohio.

■ ■

Home Heating Booklet Ready

The third edition, completely revised, of "Helpful Suggestions on Home Heating with Gas," published by Mid-West Gas Association, is now available to gas companies. Sample booklets may be obtained by writing to R. B. Searing, secretary of the Association, 302 Utilities Building, Sioux City, Iowa. The booklet contains suggestions on heat conservation, explains the relationship between humidity control and heating comfort, and describes the process by which gas heats the home. Technical terms have been largely eliminated.

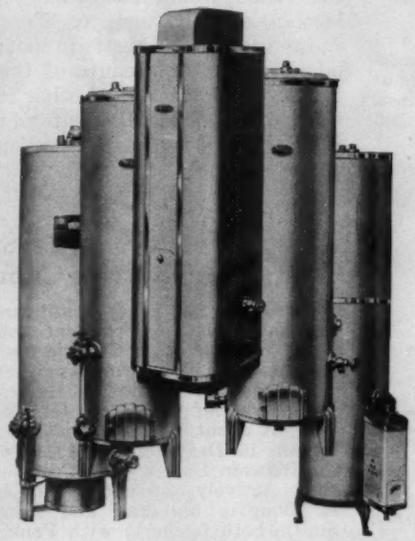
■ ■

Kansas Cities to Receive Gas Service in September

Natural gas service by September 1 is expected for Ness City, Bazine, Alexander, and McCracken, Kan., where The Western Light & Power Corp. is laying distribution lines, according to O. G. Waggoner, division superintendent. The company is carrying on an active merchandising campaign. Free service is given to customers during the construction period, if they sign to use gas when service is available. Five out of six school buildings have purchased conversion equipment. Four hundred customers are expected by October 1, with an ultimate market of 600.

On The Pacific Coast

. . . as well as elsewhere



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Standard Line *Master Line*
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Combination Line *Conversion Line*

HOTZONE Welsbach — **SELF ACTION STORAGE GAS WATER HEATERS**

are an increasing favorite with gas companies and their consumers . . . because of their unfailing dependability . . . because of their ability to perform *smoothly* and *efficiently* under all conditions . . . because the completeness of the Welsbach Line includes a type and size to fit every domestic requirement. Write today for details!

Welsbach Company

Gloucester City, N. J.

BRANCHES IN CHICAGO AND SAN FRANCISCO

Since 1887 Pioneers in the Manufacture of Gas Burning Appliances

Consumers should be enthusiastic about Gas Service . . . .

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BLAW-KNOX GAS CLEANERS

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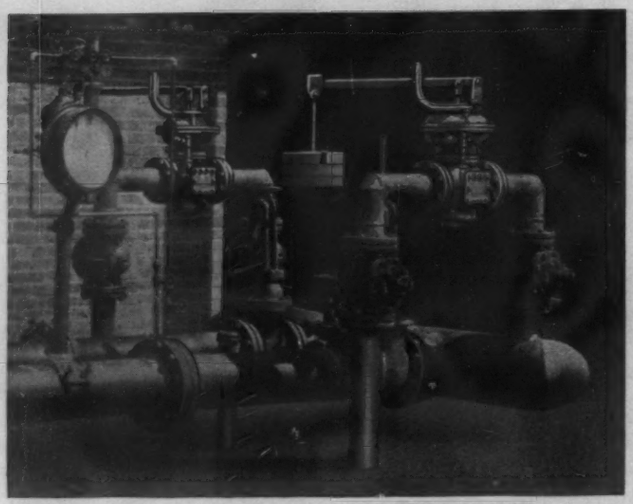

Twin installation of Reynolds new pounds-to-pound regulator at the plant of Ball Bros. Glass Co., Muncie, Ind.

Glass Plant Uses Reynolds Regulator

A REYNOLDS new pounds-to-pound regulator, in duplicate, has been installed by the Central Indiana Gas Co., Muncie, Ind., at the plant of Ball Bros. Glass Co. This type of installation, according to the manufacturer, Reynolds Gas Regulator Co., provides steady volume at desired outlet pressure and offers a margin of extra volume if required. A range of inlet pressures from one pound to a thousand pounds is possible.

Though the installation is in duplicate, only one side is required at a time. The other is a standby. According to the gas company, mechanical failure of regulating or metering equipment would be disastrous at this plant, even for as short a period as one hour, because the molten glass in the tanks would cool and begin to harden on the surface. The utility chose to install this twin pounds-to-pound regulator because of the satisfactory performance of other installations of Reynolds Regulators. So far it has not been necessary to open the valves on the second unit.

■ ■

Delavan Leaves Penn Switch Co. To Form Service Company

Nelson B. Delaven has announced his resignation as vice-president and director of sales of Penn Electric Switch Co. and his plans to form a new company with headquarters in Des Moines, Iowa. The move of Penn to Goshen, Ind., brought about Mr. Delaven's decision to remain in Des Moines and to organize the Delaven Engineering Co., a partnership. Actively associated with him are R. Douglas Marshall and Randall A. Smith, both formerly with Penn.

Delaven Engineering Co. will act as factory engineering sales representative for certain companies in the Middle West.

Mr. Delaven was associated with Goulds Pumps, Inc., of Seneca Falls, N. Y., for nine years as assistant to the general manager and merchandising manager before joining Penn. For nearly seven years he has acted as sales manager and, during the latter part of that period, as vice-president and director of sales for Penn Electric Switch Co.

Mr. Marshall was western sales manager for Penn for about three years and Mr. Smith a sales engineer.

■ ■

New England Association Accounting Division Meets

The June Accounting Division meeting of The New England Gas Association held at Hotel Kimball, Springfield, Mass., featured a discussion of accounting for salesmen's commissions, led by M. L. Hatch, office manager, Arlington Gas Light Co., and an address, "Humanics," by Professor F. Alexander Magoon, professor of Humanics, Massachusetts Institute of Technology. There was also a skit, "Mrs. Murphy Goes to Town," by employees of the Lawrence Gas and Electric Co.

■ ■

New Johns-Manville Factory

To meet increasing demands on the Pacific Coast for J-M Transite asbestos-cement pipe and electrical conduit, Lewis H. Brown, president of Johns-Manville Corp., has announced that the Johns-Manville Products Corp. has acquired an option to purchase a 50-acre plot of land in Watson, suburb of Los Angeles, Calif., and plans to start as soon as possible on the construction of the first unit of a new million-dollar factory which will manufacture Transite pipe and conduit, as well as rock wool home insulation.

THE TREND TOWARDS HIGHER EFFICIENCIES IN GAS APPLIANCES CREATES A DEFINITE DEMAND FOR A VENT PIPE CAPABLE OF EXHAUSTING THE BURNT GASES TO THE OUTER AIR AT COMPARATIVELY LOW TEMPERATURES. ACTUAL INSTALLATIONS AND TESTS PROVE THAT NO PIPE IN COMMON USE IS AS EFFICIENT IN THIS RESPECT AS

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MILWAUKEE ★ WISCONSIN

GAS VALVE SERIES 500

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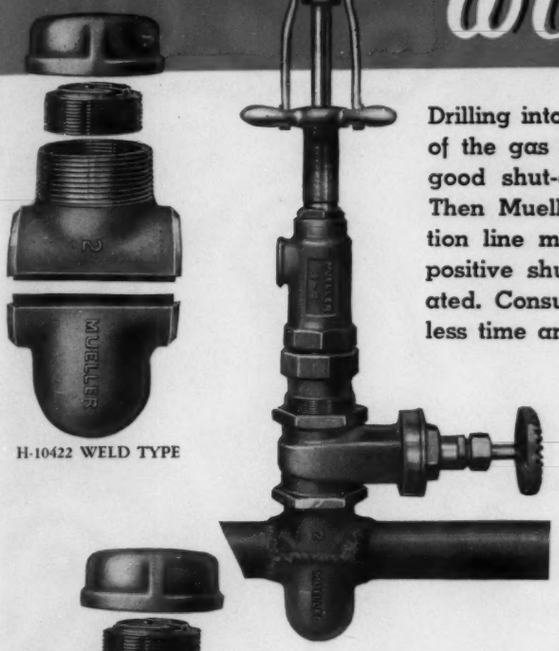
MUELLER

PRESSURE CONTROL FITTINGS SOLVE DRILLING PROBLEMS *without shutdown*



H-10422 WELD TYPE

Drilling into distribution lines to make connections or replacements used to be one of the gas engineer's greatest problems. It involved locating valves, obtaining a good shut-off, and continuing supply to consumers. It couldn't be done!

Then Mueller's offered Pressure Control Fittings and equipment. NOW a distribution line may be drilled and any repair made without interruption to service. A positive shut-off is assured. Repair cost is reduced. Danger to workmen is eliminated. Consumers are not inconvenienced. The job is completed easier, cheaper, in less time and with greater safety.

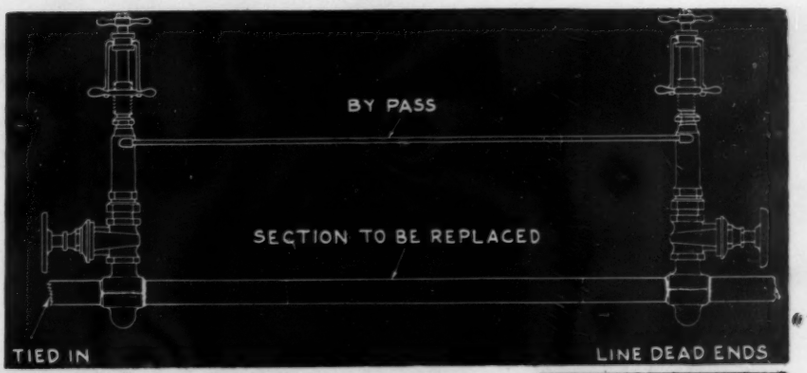
Install weld type on steel pipe; mechanical joint type on steel or cast iron pipe. Write, today, for complete information on installation and necessary equipment. Take advantage of the SAVINGS and GOOD WILL PROTECTION that Mueller Pressure Control Fittings give.

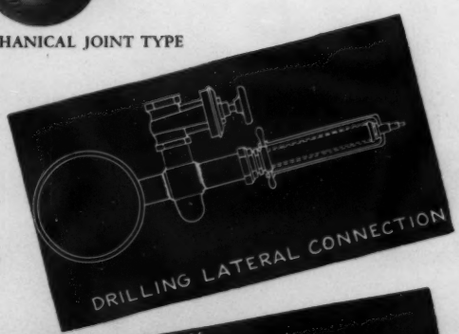
MUELLER CO.

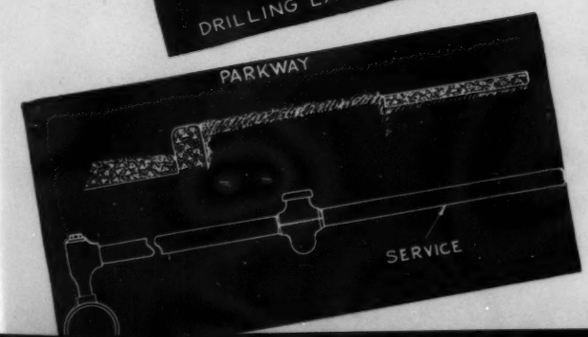
LOS ANGELES, CALIFORNIA

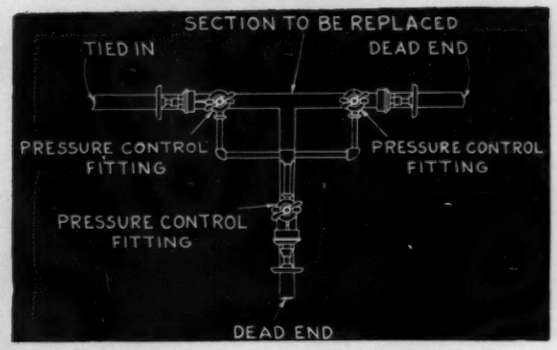
H-10424 MECHANICAL JOINT TYPE

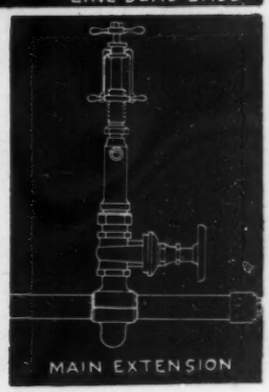
TYPICAL USES OF MUELLER PRESSURE CONTROL FITTINGS



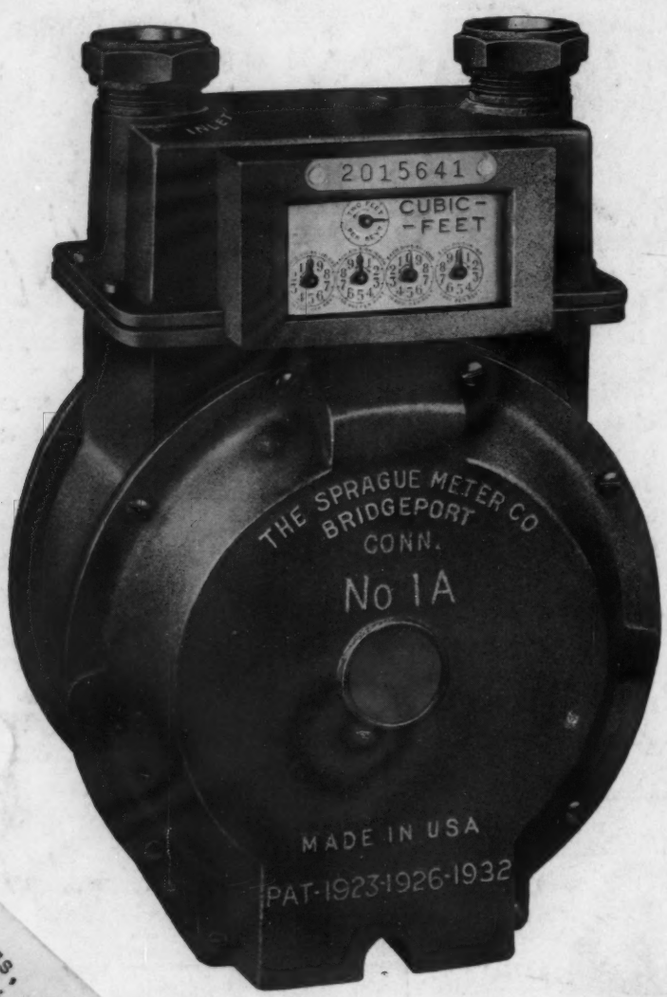








SAVE SHUTDOWN EXPENSE



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